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10. Baskı / 10th Edition

YÖS

MATEMATİK
MATHEMATICS

Sadece Test
Only Tests

XXXX çözümlü soru
questions with solutions

XXX alıştırma sorusu
exercise questions

1040 cevaplı test sorusu
practice questions
with answers

abs

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رياضيّات متروبول مدمج بدون شرح

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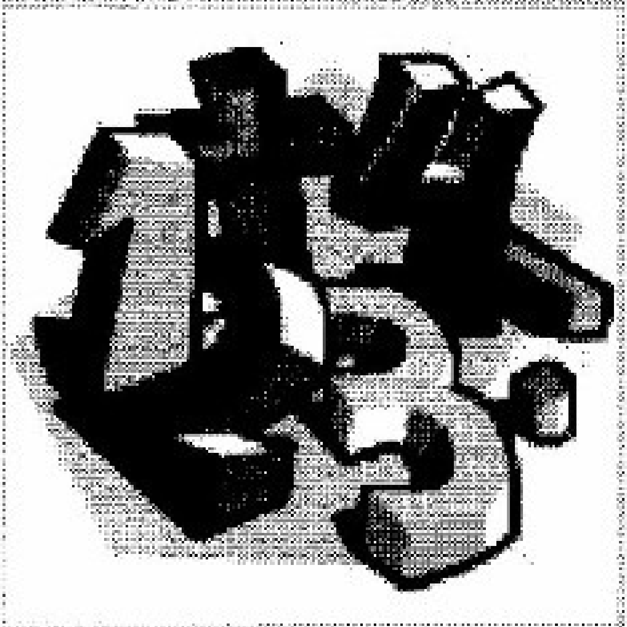
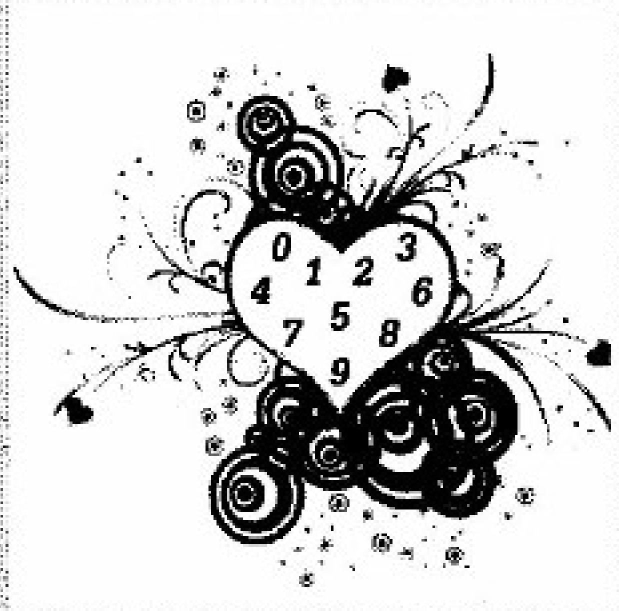
ÜNİTE 1

UNIT



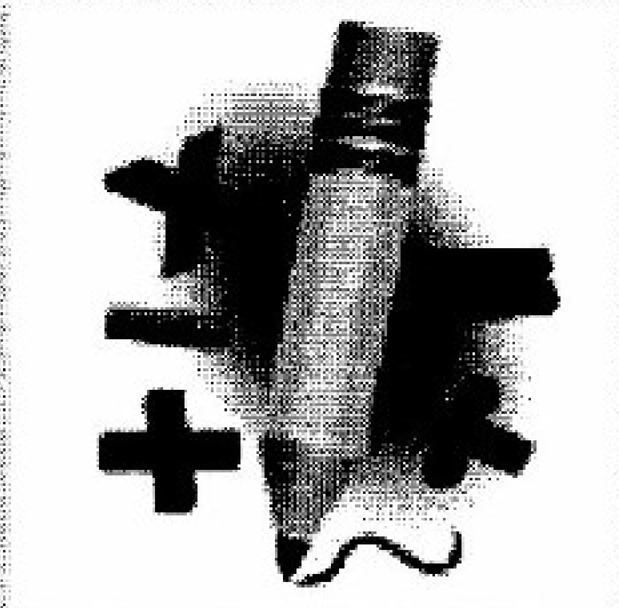
Sayılar, günlük yaşamımızda çok sık kullandığımız kavramlardandır. Matematiğin temel taşlarından olan bu kavram, insanların sayma gereksinimlerini karşılamak amacıyla geliştirilmiştir. Bu ünitede; sayılar, rasyonel ve ondalık sayılar kavramları ve bu kavramların özellikleri ayrıntılı bir şekilde anlatılmıştır. Öğrencilerin bu konuyu iyi öğrenmiş olmaları, bundan sonraki konulara temel oluşturacağından önemlidir.

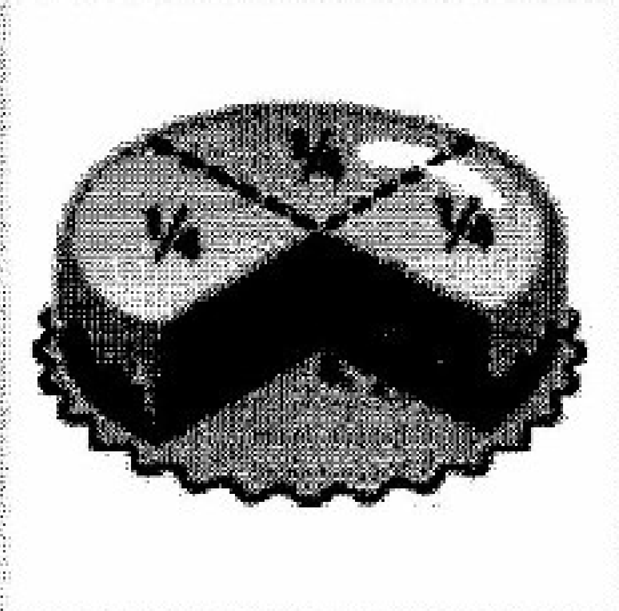
Bu ünite, 64 çözümlü örnek, 36 alıştırma, 120 test sorusu içermektedir.

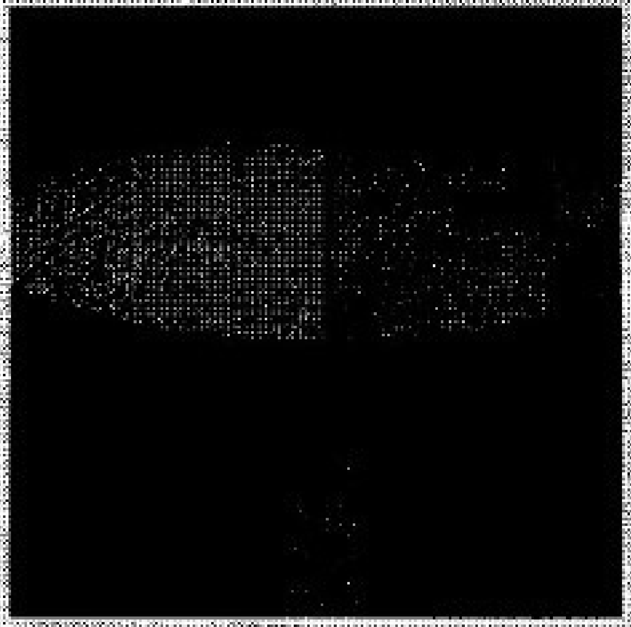


We are using the number concept in real-life. This concept is product for the counting necessarily that fundamental stone of mathematics. In this unit, numbers, rational and decimal numbers are explained in detailed. Since these concepts are essential of mathematics, students must be very good learning.

This unit includes; 120 test questions.







◆ **SAYILAR / *NUMBERS*** .... 3 – 38

◆ **RASYONEL ve ONDALIK SAYILAR**
RATIONAL and DECIMAL NUMBERS .... 39 – 68

1. $2A - B = 10$

   $A + 4B = 8$

   $\Rightarrow A + B = ?$

   A) 4

   B) 6

   C) 8

   D) 10

   E) 12

2. $-4 - (-7)\cdot(-2) + [9 : 3 + 6] = ?$

   A) –13

   B) –12

   C) –11

   D) –10

   E) –9

3. $AB + BA - BB = 22 \Rightarrow A = ?$

   A) 1

   B) 2

   C) 3

   D) 4

   E) 5

4. $AB - BA = 63 \Rightarrow \max(B) + \min(B) = ?$

   A) 2

   B) 3

   C) 4

   D) 5

   E) 6

5. $A, B, C \in Z^+$

   $A \cdot B = 42$

   $B \cdot C = 63$

   $\Rightarrow \min(A + B + C) = ?$

   A) 22

   B) 26

   C) 34

   D) 40

   E) 46

6. $\dfrac{7! + 8! + 9!}{7!} = ?$

   A) 65

   B) 68

   C) 72

   D) 78

   E) 81

7. $3! \cdot x + 5! \cdot x = 8! \Rightarrow$ **x = ?**

A) 240

B) 260

C) 300

D) 320

E) 360

8. $\dfrac{\mathbf{5+7+9+\ldots\ldots+103}}{\mathbf{27}} = \mathbf{?}$

A) 100

B) 110

C) 120

D) 130

E) 140

9. $A = 3 + 5 + 7 + \ldots + 19$

$B = 1 + 2 + \ldots + 20$

$\Rightarrow$ **A + B = ?**

A) 301

B) 303

C) 306

D) 309

E) 311

10. $(214)_5 + 12 = (x)_5 \Rightarrow$ **x = ?**

A) 221

B) 230

C) 234

D) 241

E)243

11. $(30a2)_5 = (576)_8 \Rightarrow$ **a = ?**

A) 0

B) 1

C) 2

D) 3

E) 4

12. $(x)_6 = 2 \cdot 6^3 + 4 \cdot 6^2 + 5 \Rightarrow$ **x = ?**

A) 5402

B) 5142

C) 4025

D) 2415

E) 2405

YANITLAR / ANSWERS

1. B 2. E 3. B 4. B 5. A 6. E 7. D 8. A

9. D 10. D 11. B 12. E

1.

$$\begin{aligned} 2A - B &= 10 \\ + \quad A + 4B &= 8 \\ \hline 3A + 3B &= 18 \\ 3(A + B) &= 18 \\ A + B &= 6 \end{aligned}$$

Yanıt / The Answer is B

2. $-4 - (-7)\cdot(-2) + [9 : 3 + 6] = -4 + 7\cdot(-2) + [3 + 6]$

$= -18 + 9$

$= -9$

Yanıt / The Answer is E

3. $AB + BA - BB = 11(A + B) - 11B$

$11A = 22$

$= 2$

Yanıt / The Answer is B

4. $AB - BA = 9(A - B) = 63$

$A - B = 7$

$\max(B) = 2, \min(B) = 1$

$\Rightarrow \max(B) + \min(B) = 2 + 1 = 3$

Yanıt / The Answer is B

5. $A\cdot B = 42,$

$A, B \in Z^+ \Rightarrow \min(A) = 6, \ \min(B) = 7$

$B\cdot C = 63,$

$B, C \in Z^+ \ \min(B) = 7 \ \Rightarrow \ \min(C) = 9$

$\Rightarrow \min(A + B + C) = 6 + 7 + 9 = 22$

Yanıt / The Answer is A

6. $\dfrac{7! + 8! + 9!}{7!} = \dfrac{7!(1 + 8 + 8\cdot 9)}{7!}$

$= 81$

Yanıt / The Answer is E

7. $3! \cdot x + 5! \cdot x = 8!$

$3! \cdot x\,(1 + 4 \cdot 5) = 8!$

$x \cdot (21) = 4 \cdot 5 \cdot 6 \cdot 7 \cdot 8$

$x = 320$

Yanıt / The Answer is D

---

8. $$\frac{5+7+9+\ldots+103}{27} = \frac{\left(\frac{103-5}{2}+1\right)\cdot\left(\frac{103+5}{2}\right)}{27}$$

$$= \frac{50 \cdot 54}{27}$$

$$= 100$$

Yanıt / The Answer is A

---

9. $A = 3 + 5 + \ldots + 19 = 10^2 - 1 = 99$

$B = 1 + 2 + \ldots + 20 = \frac{20 \cdot 21}{2} = 210$

$\Rightarrow A + B = 99 + 210 = 309$

Yanıt / The Answer is D

---

10. $(12)_{10} = (a)_5 \;\Rightarrow\; a = 22$

$(214)_5 + (22)_5 = (x)_5$

$x = 241$

Yanıt / The Answer is D

---

11. $(30a2)_5 = (576)_8$

$\Rightarrow 2 \cdot 5^0 + a \cdot 5^1 + 0 \cdot 5^2 + 3 \cdot 5^3 = 6 \cdot 8^0 + 7 \cdot 8^1 + 5 \cdot 8^2$

$2 + 5a + 0 + 375 = 6 + 56 + 320$

$377 + 5a = 382$

$5a = 382 - 377$

$5a = 5$

$a = 1$

Yanıt / The Answer is B

---

12. $(x)_6 = 2 \cdot 6^3 + 4 \cdot 6^2 + 5$

$(x)_6 = 2 \cdot 6^3 + 4 \cdot 6^2 + 0 \cdot 6^1 + 5 \cdot 6^0$

$\Rightarrow x = 2405$

Yanıt / The Answer is E

1. $2A + B = 9$

$B - C = 5$

$A - D = 4 \Rightarrow \mathbf{A + C + D = ?}$

Yanıt / The Answer is: **0**

2. $A, B \in Z^+$

$2A + 3B = 45 \Rightarrow \mathbf{(A + B)_{min} = ?}$

Yanıt / The Answer is: **16**

3. $\dfrac{6! + 7!}{5! + 6!} = ?$

Yanıt / The Answer is: $\dfrac{48}{7}$

4. $\dfrac{(n+1)!}{(n-1)!} = 42 \Rightarrow \mathbf{n = ?}$

Yanıt / The Answer is: **6**

5. $\dfrac{(n+1)! + n! + (n-1)!}{(n-1)!} = 49 \Rightarrow \mathbf{n = ?}$

Yanıt / The Answer is: **6**

6. $\dfrac{(n-2)!}{(n-4)!} = 20 \Rightarrow \mathbf{n = ?}$

Yanıt / The Answer is: **7**

7. $\frac{(n+1)!}{2(n-1)!}+\frac{(n+1)!}{6(n-2)!}=\frac{8(n+1)!}{n!} \Rightarrow \mathbf{n=?}$

Yanıt / The Answer is: **6**

8. $\frac{25!}{8^n}=A \qquad n, A \in N \Rightarrow \mathbf{max(n) = ?}$

Yanıt / The Answer is: **7**

9. $\frac{10! \cdot 25!}{12!}=x \cdot 10^n \qquad n, x \in N \Rightarrow \mathbf{max(n) = ?}$

Yanıt / The Answer is: **6**

10. $32 + 33 + \dots + 58 = ?$

Yanıt / The Answer is: **1215**

11. $10 + 11 + 12 + \dots + 89 + 90 + 89 + 88 + \dots + 9 + 8 = ?$

Yanıt / The Answer is: **8027**

12. $12 + 15 + \dots + 6n = 390 \Rightarrow \mathbf{n = ?}$

Yanıt / The Answer is: **8**

13. **$13 - 50 + 15 - 48 + 17 - 46 + \ldots 27 - 36 + 29 = ?$**

Yanıt / The Answer is: **−155**

14. $A = 4 \cdot 6 + 5 \cdot 7 + 6 \cdot 8 + \ldots + 24 \cdot 26$

$B = 4 \cdot 4 + 5 \cdot 5 + 6 \cdot 6 + \ldots + 24 \cdot 24$

$\Rightarrow$ **$A - B = ?$**

Yanıt / The Answer is: **588**

15. $(213)_5 = (20x1)_3 \Rightarrow$ **$x = ?$**

Yanıt / The Answer is: **1**

16. $(a3)_{a+2} = 38 \Rightarrow$ **$a = ?$**

Yanıt / The Answer is: **5**

17. $(a15)_{3a} = 83 \Rightarrow$ **$a = ?$**

Yanıt / The Answer is: **2**

18. $(123)_5 \cdot 6 = (x)_5 \Rightarrow$ **$x = ?$**

Yanıt / The Answer is: **1403**

19. $(13,\ 12)_4 = (x)_{10} \quad \Rightarrow \quad \mathbf{x = ?}$

Yanıt / The Answer is: $\mathbf{\frac{59}{8}}$

20. $\dfrac{a+4b-c}{b+c} = 4, \quad a,b,c \in Z^+ \quad \Rightarrow \quad \mathbf{min(a+b+c) = ?}$

Yanıt / The Answer is: **7**

21. $a + b = 9, \qquad \dfrac{a}{b} + 1 = c,$

$a,\ b,\ c \in Z^+ \quad \Rightarrow \quad \mathbf{\sum b = ?}$

Yanıt / The Answer is: **4**

22. $abc - cba = 594 \quad \Rightarrow \quad \mathbf{\sum c = ?}$

Yanıt / The Answer is: **6**

23.

$$\begin{array}{r|l} A & 75 \\ \cline{2-2} - \quad & n+1 \\ \cline{1-1} n^3 & \end{array} \quad \Rightarrow \quad \mathbf{max(A) = ?}$$

Yanıt / The Answer is: **439**

24.

$$\begin{array}{r|l} A & 8 \\ \cline{2-2} - \quad & C \\ \cline{1-1} 2 & \end{array} \qquad \begin{array}{r|l} C & 6 \\ \cline{2-2} - \quad & B \\ \cline{1-1} 4 & \end{array} \qquad \begin{array}{r|l} A & 24 \\ \cline{2-2} - \quad & \\ \cline{1-1} x & \end{array}$$

$\Rightarrow \quad \mathbf{x = ?}$

Yanıt / The Answer is: **10**

1. $7 - \{[(-1) - 7 - (-9)] - (-5)\} = ?$

A) 0
B) 1
C) 2
D) 3
E) 4

2. $8 : 2 - \{[(-2) - (-3) - (-4)] - 3\} = ?$

A) 2
B) 3
C) 4
D) 5
E) 6

3. $[3\cdot(3^{-1} + 2^{-1}) + 1] + 2 = ?$

A) $\frac{7}{2}$
B) $\frac{9}{2}$
C) $\frac{11}{2}$
D) $\frac{13}{2}$
E) $\frac{15}{2}$

4. $[2\cdot(3^{-1} - 4^{-1}) + 1]^{-1} = ?$

A) $\frac{2}{7}$
B) $\frac{3}{7}$
C) $\frac{4}{7}$
D) $\frac{5}{7}$
E) $\frac{6}{7}$

5. $\frac{AB + BA}{AA} = 3 \Rightarrow \max(B - A) = ?$

A) 2
B) 3
C) 4
D) 5
E) 6

6. $AB + BA = 88$
$AB - BA = 54 \Rightarrow 2A + B = ?$

A) 14
B) 15
C) 16
D) 17
E) 18

7. $a, b \in Z^+$,

$(17 - a)\cdot(a - 6) = b \Rightarrow \boldsymbol{\sum a = ?}$

A) 110

B) 115

C) 120

D) 130

E) 140

8. $a \neq b \neq c$,

$a, b, c \in Z^+$,

$2a + b + \frac{c}{3} = 12 \Rightarrow \mathbf{max(c) = ?}$

A) 3

B) 6

C) 9

D) 24

E) 27

9.

$$\begin{array}{r|l} A & C+2 \\ \hline - & 5 \\ C & \end{array} \qquad \begin{array}{r|l} B & C \\ \hline - & 6 \\ 2 & \end{array} \Rightarrow \mathbf{A - B = ?}$$

A) 6

B) 7

C) 8

D) 9

E) 10

10.

$$\begin{array}{r|l} A & 5 \\ \hline - & B \\ 2 & \end{array} \qquad \begin{array}{r|l} A+1 & B-1 \\ \hline - & 5 \\ C & \end{array} \Rightarrow \mathbf{C = ?}$$

A) 4

B) 5

C) 6

D) 7

E) 8

11.

$$\begin{array}{r|l} ABAB3 & AB \\ \hline - & x \\ y & \end{array} \Rightarrow \mathbf{x + y = ?}$$

A) 103

B) 104

C) 114

D) 1003

E) 1013

12.

$$\begin{array}{r|l} A & 18 \\ \hline - & B \\ B^2 & \end{array} \Rightarrow \mathbf{max(A) = ?}$$

A) 88

B) 90

C) 92

D) 94

E) 96

YANITLAR / ANSWERS

1. B	2. A	3. C	4. E	5. C.	6. B	7. B	8. D
9. C	10. E	11. E	12. A				

1. $3 - 4 : 2 + 5 \cdot [3 - 4 - (-2)] = ?$

A) 5

B) 6

C) 7

D) 8

E) 9

2. $[-2^2 + (-3)^3 : (-3)] : [(-2)^2 + 1] = ?$

A) 1

B) 2

C) 3

D) 4

E) 5

3. $(-3)^2 - 2^2 - (-2)^3 \cdot [-3 - (-2)]^{-1} = ?$

A) –6

B) –5

C) –4

D) –3

E) –2

4. $2x - [-(x + z) - 2(y - z) + 3x] = ?$

A) $2x + y$

B) $x - z$

C) $y + z$

D) $2y - z$

E) $2x + z$

5. $AB + BA = 7(A + B) + 32 \Rightarrow$ **max(A) = ?**

A) 4

B) 5

C) 6

D) 7

E) 8

6. $A, B \in N$,

$A + B = 20 \Rightarrow$ **min(A·B) = ?**

A) 0

B) 25

C) 50

D) 75

E) 100

7. $A, B \in Z^+$

$A + B = 50 \Rightarrow$ **min(A·B) + max(A·B) = ?**

A) 625

B) 632

C) 645

D) 668

E) 674

8.

$$\begin{array}{r|l} AA & 9 \\ \cline{2-2} - \quad & A \\ \cline{1-1} 8 & \end{array} \quad \Rightarrow \mathbf{A = ?}$$

A) 1

B) 2

C) 3

D) 4

E) 5

9.

$$\begin{array}{r|l} AB & 8 \\ \cline{2-2} - \quad & x-4 \\ \cline{1-1} x+1 & \end{array} \quad \Rightarrow \mathbf{max\ (AB) = ?}$$

A) 18

B) 21

C) 23

D) 29

E) 35

10. $A, B, C \in Z^+$

$3 \cdot A = 7 \cdot B, \quad C = 2 \cdot A$

$\Rightarrow$ **min(C) = ?**

A) 10

B) 12

C) 14

D) 16

E) 18

11. $A, B, C \in Z^+$,

$A \neq B \neq C$

$A + 2B + 3C = 45 \Rightarrow$ **max(A) = ?**

A) 34

B) 35

C) 36

D) 37

E) 38

12. $a + \dfrac{12}{b} = 10,$

$a, b \in Z^+ \quad \Rightarrow \quad$ **$\sum a = ?$**

A)23

B) 25

C) 26

D) 30

E) 34

YANITLAR / ANSWERS

1. B	**2. A**	**3. D**	**4. D**	**5. D**	**6. A**	**7. E**	**8. D**
9. C	**10. C**	**11. E**	**12. E**				

1. $3 + 6 + 9 + \ldots + 72 = ?$

A) 895
B) 896
C) 897
D) 900
E) 903

2. $7 + 11 + 15 + \ldots + 91 = ?$

A) 1078
B) 1082
C) 1096
D) 1104
E) 1108

3. $\frac{2}{3} + \frac{3}{2} + \frac{4}{3} + \frac{5}{2} + \ldots\ldots + \frac{49}{2} = ?$

A) 508
B) 512
C) 516
D) 520
E) 524

4. $9 + 11 + 13 + \ldots + (2n - 1) = 425 \Rightarrow n = ?$

A) 17
B) 19
C) 21
D) 23
E) 25

5. $8 + 10 + 12 + \ldots + 2n = 408 \Rightarrow n = ?$

A) 16
B) 18
C) 20
D) 22
E) 24

6. $\frac{4 + 8 + 12 + \ldots\ldots + 92}{16 + 24 + 32 + \ldots\ldots + 192} = ?$

A) $\frac{3}{13}$
B) $\frac{4}{13}$
C) $\frac{5}{13}$
D) $\frac{6}{13}$
E) $\frac{7}{13}$

7. $\mathbf{3 - 4 + 5 - 6 + \ldots - 30 = ?}$

A) -15
B) -14
C) -13
D) -12
E) -11

8. $\mathbf{-9 - 5 - 1 + 3 + \ldots + 43 = ?}$

A) 224
B) 230
C) 238
D) 242
E) 246

9. $1 + 2 + 3 + \ldots + 16 = A$
$2 + 4 + 6 + \ldots + 16 = B$
$\Rightarrow$ $\mathbf{A + B = ?}$

A) 206
B) 208
C) 209
D) 210
E) 212

10. $7 + 9 + \ldots + n = A$
$10 + 12 + \ldots + (n + 1) = B$
$A + B = 181 \Rightarrow$ $\mathbf{n = ?}$

A) 27
B) 25
C) 23
D) 21
E) 19

11. $A = 6 + 7 + 8 + \ldots + n$
$B = 2 + 3 + 4 + \ldots + n + 1$
$A + B = n + 225 \Rightarrow$ $\mathbf{n = ?}$

A) 11
B) 12
C) 13
D) 14
E) 15

12. $A = 5 + 6 + 7 + \ldots + n$
$B = 2 + 3 + 4 + \ldots + n - 2$
$A - B = 80 \Rightarrow$ $\mathbf{n = ?}$

A) 41
B) 42
C) 43
D) 44
E) 45

YANITLAR / ANSWERS

1. D 2. A 3. B 4. C 5. C 6. D 7. B 8. C
9. B 10. E 11. E 12. E

1. $\dfrac{7!-2\cdot 8!+9!}{8!+6!}=?$

A) 5
B) 6
C) 7
D) 8
E) 9

2. $\dfrac{6!-5\cdot 7!+8!}{5!+2\cdot 3!}=?$

A) 80
B) 90
C) 100
D) 110
E) 120

3. $\dfrac{(n-3)!+(3-n)!}{(n-2)!}=?$

A) 0
B) 1
C) 2
D) 3
E) 4

4. $\dfrac{(n+1)!}{8!}=90 \Rightarrow n=?$

A) 9
B) 10
C) 11
D) 12
E) 13

5. $\dfrac{(n-2)!+(n-3)!}{2(n-4)!+(n-3)!}=8 \Rightarrow n=?$

A) 7
B) 8
C) 9
D) 10
E) 11

6. $(ab)!=(9a+4b)! \Rightarrow \sum ab=?$

A) 174
B) 186
C) 192
D) 202
E) 214

7. $50! = A \cdot 2^n \cdot 15^m$,

$n, m, A \in N^+$

$\Rightarrow$ **$\max(n+m) = ?$**

A) 56

B) 57

C) 58

D) 59

E) 60

8. $n, A \in N^+$,

$$\frac{48!}{8^n} = A \Rightarrow \mathbf{max(n) = ?}$$

A) 12

B) 13

C) 14

D) 15

E) 16

9. $n, A \in N^+$,

$$\frac{38! + 39!}{10^n} = A \Rightarrow \mathbf{max(n) = ?}$$

A) 7

B) 8

C) 9

D) 10

E) 11

10. $n, A \in N^+$,

$$\frac{90! - 86!}{10^n} = A \Rightarrow \mathbf{max(n) = ?}$$

A) 18

B) 20

C) 24

D) 26

E) 32

11. $1! + 4! + 7! + \ldots + 2027! = \ldots\ldots x \Rightarrow$ **$x = ?$**

A) 2

B) 3

C) 4

D) 5

E) 6

12.

$$\begin{array}{l|l} \;\; 2! + 4! + 6! + \ldots + 2006! & 15 \\ \hline - \qquad\qquad\qquad\qquad & \\ \qquad\qquad\qquad\qquad\quad k & \end{array} \Rightarrow \mathbf{k = ?}$$

A) 7

B) 8

C) 9

D) 10

E) 11

YANITLAR / ANSWERS

1. C	2. E	3. C	4. A	5. E	6. B	7. D	8. D
9. C	10. B	11. D	12. E				

1. $(102)_a + (a2)_4 = (x)_{10} \Rightarrow x = ?$

A) 15
B) 20
C) 25
D) 30
E) 35

2. $(302)_4 = (x)_5 \Rightarrow x = ?$

A) 103
B) 104
C) 200
D) 210
E) 213

3. $(23)_x = (102)_3 \Rightarrow x = ?$

A) 4
B) 5
C) 6
D) 7
E) 8

4. $(xyx)_6 = (yyx)_5 \Rightarrow x + y = ?$

A) 9
B) 8
C) 7
D) 6
E) 5

5. $(231)_5 + (142)_5 - (204)_5 = (x)_5 \Rightarrow x = ?$

A) 210
B) 211
C) 212
D) 213
E) 214

6. $(314)_6 \cdot (52)_6 = (x)_6 \Rightarrow x = ?$

A) 24203
B) 25252
C) 25312
D) 25402
E) 31023

7. $(3a)_{a+1} = (4b)_a \Rightarrow \mathbf{b = ?}$

A) 1

B) 2

C) 3

D) 4

E) 5

8. $(xx2)_5 = (yy)_7 \Rightarrow \mathbf{x + y = ?}$

A) 3

B) 4

C) 5

D) 6

E) 7

9. $(34x)_5 < (xxx)_6 \Rightarrow \mathbf{min(x) = ?}$

A) 1

B) 2

C) 3

D) 4

E) 5

10. $3a^8 + 2a^6 + a^2 + 1 = (x)_{a^2}$

$\Rightarrow \mathbf{x = ?}$

A) 3211

B) 30211

C) 32101

D) 32011

E) 32010

11. $(x)_8 = 3{\cdot}8^3 + 7{\cdot}8^2 + 43 \Rightarrow \mathbf{x = ?}$

A) 3643

B) 3673

C) 3726

D) 3753

E) 3761

12. $(12{,}31)_4 = (x)_{10} \Rightarrow \mathbf{x = ?}$

A) $\frac{35}{4}$

B) $\frac{47}{4}$

C) $\frac{81}{16}$

D) $\frac{105}{16}$

E) $\frac{109}{16}$

YANITLAR / ANSWERS

1. C	2. C	3. A	4. E	5. E	6. B	7. C	8. C
9. C	10. D	11. D	12. E				

1. $\left(\frac{1}{2}+\frac{1}{3}-\frac{1}{4}\right)-\left(\frac{1}{3}+\frac{1}{5}\right)-\left(\frac{1}{2}-\frac{1}{5}\right)=?$

A) $-\frac{1}{2}$ B) $-\frac{1}{3}$ C) $-\frac{1}{4}$

D) $-\frac{1}{5}$ E) $-\frac{1}{6}$

---

2. $\dfrac{\left(3-\frac{1}{2}\right)-\left(5-\frac{3}{2}\right)}{\left(4+\frac{2}{3}\right)-\left(2-\frac{4}{3}\right)}=?$

A) $-\frac{1}{6}$ B) $-\frac{1}{5}$ C) $-\frac{1}{4}$

D) $-\frac{1}{3}$ E) $-\frac{1}{2}$

---

3. $3-\dfrac{6}{1+\dfrac{2}{4-\dfrac{2-x}{6}}}=1 \Rightarrow x=?$

A) -16 B) -15 C) -14

D) -13 E) -12

---

4. $1+\dfrac{2-\dfrac{3}{\frac{1}{2}+1}}{3+\dfrac{4}{2-\frac{1}{3}}}=?$

A) -1 B) 1 C) 2

D) 3 E) 4

---

5. $\left(1-\frac{1}{2}\right)\left(2-\frac{2}{3}\right)\left(3-\frac{3}{4}\right)\ldots\ldots\left(6-\frac{6}{7}\right)=?$

A) $\frac{680}{7}$ B) $\frac{690}{7}$ C) $\frac{710}{7}$

D) $\frac{720}{7}$ E) $\frac{730}{7}$

---

6. $a=\frac{2}{13}$, $b=\frac{4}{15}$, $c=\frac{4}{11}$ $\Rightarrow$ $?<?<?$

A) $a<c<b$ B) $a<b<c$ C) $b<a<c$

D) $c<b<a$ E) $b<c<a$

7. $0{,}04:\left[(0{,}6:0{,}7):\dfrac{3}{14}\right]=?$

A) 0,01
B) 0,02
C) 0,03
D) 0,04
E) 0,05

8. $$\frac{\dfrac{1}{0{,}1}-\dfrac{3}{0{,}5-\dfrac{1}{0{,}5}}}{3+\dfrac{1}{0{,}5}}=?$$

A) $\dfrac{8}{5}$
B) 2
C) $\dfrac{12}{5}$
D) $\dfrac{14}{5}$
E) $\dfrac{16}{5}$

9. $\dfrac{a}{0{,}03}=\dfrac{b}{0{,}05}=\dfrac{c}{0{,}07} \Rightarrow ?<?<?$

A) c < a < b
B) a < b < c
C) c < b < a
D) b < a < c
E) b < c < a

10. $3{,}\overline{a}+5{,}\overline{a}+7{,}\overline{a}=16 \Rightarrow a=?$

A) 3
B) 4
C) 5
D) 6
E) 7

11. $\dfrac{0{,}2\cdot 10^{-4}+0{,}04\cdot 10^{-3}}{1{,}2\cdot 10^{-5}}=?$

A) 1
B) 2
C) 3
D) 4
E) 5

12. $\dfrac{1{,}\overline{1}+2{,}\overline{2}+3{,}\overline{3}}{0{,}\overline{2}}=?$

A) 40
B) 30
C) 20
D) 10
E) $\dfrac{1}{10}$

YANITLAR / ANSWERS

1. C	2. C	3. A	4. B	5. D	6. B	7. A	8. C
9. B	10. A	11.E	12. B				

1. $$\left(\frac{1}{2}+\frac{1}{3}-\frac{1}{4}\right)-\left(\frac{1}{3}+\frac{1}{5}\right)-\left(\frac{1}{2}-\frac{1}{5}\right)$$
$$=\frac{1}{2}+\frac{1}{3}-\frac{1}{4}-\frac{1}{3}-\frac{1}{5}-\frac{1}{2}+\frac{1}{5}$$
$$=-\frac{1}{4}$$

Yanıt / The Answer is C

---

2. $$\frac{\left(3-\frac{1}{2}\right)-\left(5-\frac{3}{2}\right)}{\left(4+\frac{2}{3}\right)-\left(2-\frac{4}{3}\right)}=\frac{\frac{5}{2}-\frac{7}{2}}{\frac{14}{3}-\frac{2}{3}}=-\frac{1}{4}$$

Yanıt / The Answer is C

---

3. $$3-\frac{6}{1+\frac{2}{4-\frac{2-x}{6}}}=1$$
$$\Rightarrow \frac{6}{1+\frac{2}{4-\frac{2-x}{6}}}=2 \Rightarrow 1+\frac{2}{4-\frac{2-x}{6}}=3$$
$$\frac{2}{4-\frac{2-x}{6}}=2$$
$$4-\frac{2-x}{6}=1$$
$$\frac{2-x}{6}=3$$
$$2-x=18 \Rightarrow x=-16$$

Yanıt / The Answer is A

---

4. $$1+\frac{2-\frac{3}{\frac{1}{2}+1}}{3+\frac{4}{2-\frac{1}{3}}}=1+\frac{2-\frac{6}{3}}{3+\frac{12}{5}}$$
$$=1+\frac{0}{\frac{27}{5}}=1$$

Yanıt / The Answer is B

---

5. $$\left(1-\frac{1}{2}\right)\left(2-\frac{2}{3}\right)\left(3-\frac{3}{4}\right)\ldots\left(6-\frac{6}{7}\right)=\frac{1}{2}\cdot\frac{4}{3}\cdot\frac{9}{4}\cdot\ldots\cdot\frac{36}{7}$$
$$=\frac{720}{7}$$

Yanıt / The Answer is D

---

6. $$\left.\begin{array}{l} a=\frac{2}{13} \Rightarrow a=\frac{4}{26} \\ b=\frac{4}{15} \Rightarrow b=\frac{4}{15} \\ c=\frac{4}{11} \Rightarrow c=\frac{4}{11} \end{array}\right\} \Rightarrow c>b>a$$

Yanıt / The Answer is B

7. $0{,}04:\left[(0{,}6:0{,}7):\dfrac{3}{14}\right]=0{,}04:\left[\dfrac{6}{7}\cdot\dfrac{14}{3}\right]$

$=0{,}04:4$

$=0{,}01$

Yanıt / The Answer is A

8. $$\dfrac{\dfrac{1}{0{,}1}-\dfrac{3}{0{,}5-\dfrac{1}{0{,}5}}}{3+\dfrac{1}{0{,}5}}=\dfrac{10-\dfrac{3}{0{,}5-2}}{3+2}=\dfrac{10+2}{5}=\dfrac{12}{5}$$

Yanıt / The Answer is C

9. $\dfrac{a}{0{,}03}=\dfrac{b}{0{,}05}=\dfrac{c}{0{,}07}$

$\dfrac{a}{\dfrac{3}{100}}=\dfrac{b}{\dfrac{5}{100}}=\dfrac{c}{\dfrac{7}{100}}$

$\dfrac{100a}{3}=\dfrac{100b}{5}=\dfrac{100c}{7}$

$\Rightarrow a<b<c$

Yanıt / The Answer is B

10. $3,\bar{a}+5,\bar{a}+7,\bar{a}=16$

$3+5+7+3\cdot(0,\bar{a})=16$

$15+3\cdot\dfrac{a}{9}=16$

$\dfrac{3a}{9}=1$

$a=3$

Yanıt / The Answer is A

11. $\dfrac{0{,}2\cdot10^{-4}+0{,}04\cdot10^{-3}}{1,2\cdot10^{-5}}=\dfrac{2\cdot10^{-5}+4\cdot10^{-5}}{1,2\cdot10^{-5}}$

$=\dfrac{10^{-5}(2+4)}{10^{-5}(1,2)}$

$=\dfrac{6}{1,2}=5$

Yanıt / The Answer is E

12. $\dfrac{1,\bar{1}+2,\bar{2}+3,\bar{3}}{0,\bar{2}}=\dfrac{1+2+3+\dfrac{1}{9}+\dfrac{2}{9}+\dfrac{3}{9}}{\dfrac{2}{9}}$

$=\dfrac{6+\dfrac{6}{9}}{\dfrac{2}{9}}$

$=30$

Yanıt / The Answer is B

1. $\dfrac{3}{\frac{2}{3}} - \dfrac{\frac{3}{2}}{3} = ?$

Yanıt / The Answer is: **4**

2. $5 : \dfrac{2 + \frac{1}{3} : \frac{2}{3}}{2\frac{1}{4} - 1} = ?$

Yanıt / The Answer is: $\dfrac{5}{2}$

3. $3 - \cfrac{1}{1 - \cfrac{1}{2 - \cfrac{1}{3 + \cfrac{1}{2}}}} = ?$

Yanıt / The Answer is: $\dfrac{3}{5}$

4. $4 - \cfrac{x}{4 - \cfrac{x}{4 - \cfrac{x}{\vdots}}} = 5 \Rightarrow x = ?$

Yanıt / The Answer is: **–5**

5. $A = \dfrac{2}{5} - \dfrac{4}{7} + \dfrac{5}{9}$

$B = -\dfrac{3}{5} + \dfrac{10}{7} - \dfrac{13}{9} \Rightarrow A = ?$

Yanıt / The Answer is: **1+ B**

6. $\left(2 + \frac{1}{2}\right) + \left(3 + \frac{1}{2}\right) + \left(4 + \frac{1}{2}\right) + \ldots \left(17 + \frac{1}{2}\right) = ?$

Yanıt / The Answer is: **160**

7. $5+\dfrac{5}{0,05}-\dfrac{0,5}{0,05}=?$

Yanıt / The Answer is: **95**

8. $\dfrac{2,3+0,02-0,305}{0,15-0,01-0,04}=?$

Yanıt / The Answer is: **20,15**

9. $\dfrac{\dfrac{3}{0,01}-\dfrac{2}{0,02}}{\dfrac{3}{0,004}}=?$

Yanıt / The Answer is: $\dfrac{4}{15}$

10. $a \in Z^{+}$

$\dfrac{1}{3}<\dfrac{a}{8}<\dfrac{7}{6} \quad \Rightarrow \sum a=?$

Yanıt / The Answer is: **42**

11. $\dfrac{x,\overline{x}-y,\overline{y}}{x,\overline{0x}-y,\overline{0y}}=?$

Yanıt / The Answer is: $\dfrac{11}{10}$

12. $a=0,\overline{7}$

$b=0,77$

$c=\dfrac{7}{10} \quad \Rightarrow \; ?<?<?$

Yanıt / The Answer is: **c < b < a**

1. $\frac{2}{3}-\frac{3}{4}:\frac{3}{5}-\frac{1}{6}=?$

A) $-\frac{3}{4}$ B) $-\frac{5}{4}$ C) $-\frac{7}{4}$

D) $-\frac{1}{2}$ E) $-\frac{3}{2}$

2. $\dfrac{\frac{2}{3}-\frac{1}{4}+\frac{3}{7}}{\frac{1}{2}+\frac{1}{7}-\frac{4}{3}}+\dfrac{\frac{5}{4}-\frac{1}{7}-\frac{10}{3}}{\frac{1}{7}-\frac{4}{3}+\frac{1}{2}}=?$

A) $\frac{1}{4}$ B) $\frac{1}{2}$ C) 1

D) $\frac{3}{2}$ E) 2

3. $\dfrac{\frac{1}{2}-\frac{1}{3}+\frac{1}{6}}{2-\frac{1}{2}-\frac{2}{3}}-\frac{1}{2}=?$

A) $-\frac{1}{12}$ B) $-\frac{1}{10}$ C) $-\frac{1}{9}$

D) $-\frac{1}{6}$ E) $-\frac{1}{3}$

4. $\left(1+\frac{1}{2}\right)\cdot\left(1+\frac{1}{3}\right)\cdot\left(1+\frac{1}{4}\right)\ldots\ldots\left(1+\frac{1}{n}\right)=\frac{29}{2}$

$\Rightarrow$ **n = ?**

A) 27 B) 28 C) 29

D) 30 E) 3

5. $\dfrac{\left(1-\frac{1}{2}\right)\left(1-\frac{1}{3}\right)\ldots\ldots\left(1-\frac{1}{x-1}\right)}{\left(1+\frac{1}{2}\right)\left(1+\frac{1}{3}\right)\ldots\ldots\left(1+\frac{1}{x-1}\right)}=\frac{1}{15}\quad\Rightarrow x=?$

A) 3 B) 4 C) 5

D) 6 E) 7

6. $5\cdot\left[1-\dfrac{3}{4-\frac{1}{4}}\cdot(-3)\right]=?$

A) 13 B) 14 C) 15

D) 16 E) 17

7. $\left(\frac{3}{2-\frac{1}{3}}\right)^{-1}:\frac{4}{3}+1\frac{1}{2}=?$

A) $1\frac{1}{12}$ B) $1\frac{5}{12}$ C) $1\frac{7}{12}$ D) $1\frac{3}{4}$ E) $1\frac{11}{12}$

8. $\left(\frac{1+\frac{2}{3}}{2}\right)^{-1}:2-\frac{4}{\frac{2}{3}}=?$

A) $-\frac{24}{5}$ B) $-\frac{26}{5}$ C) $-\frac{27}{5}$ D) $-\frac{28}{5}$ E) $-\frac{29}{5}$

9. $\frac{x}{\frac{y}{z}}\cdot\frac{\frac{y}{x}}{z}=?$

A) 1 B) x C) y D) z E) $\frac{x}{z}$

10. $\left.\begin{matrix}a-b=8\\ a\cdot b=-2\end{matrix}\right\}\Rightarrow\left(\frac{1}{a}-\frac{1}{b}\right)^{-1}=?$

A) -4 B) $-\frac{1}{4}$ C) 1 D) $\frac{1}{4}$ E) 4

11. $\frac{a-3b}{a+3b}=4\ \Rightarrow\ \frac{a}{b}+\frac{b}{a}=?$

A) $-\frac{26}{5}$ B) $-\frac{12}{5}$ C) $\frac{4}{5}$ D) $\frac{16}{5}$ E) $\frac{26}{5}$

12. $\left.\begin{matrix}x=a-\frac{1}{b}\\ y=b-\frac{1}{a}\end{matrix}\right\}\Rightarrow\frac{x}{y}=?$

A) -1 B) 1 C) $\frac{a}{b}$ D) $\frac{b}{a}$ E) $a\cdot b$

YANITLAR / ANSWERS

1. A	2. E	3. B	4. B	5. D	6. E	7. E	8. C
9. A	10. D	11. A	12. C				

1. $2-\cfrac{1}{1+\cfrac{3}{4+\cfrac{1}{2}}}=?$

A) $\frac{4}{5}$ B) $\frac{6}{5}$ C) $\frac{7}{5}$ D) $\frac{8}{5}$ E) $\frac{9}{5}$

2. $2-\cfrac{1}{2-\cfrac{1}{2-\cfrac{1}{2-\cfrac{1}{2}}}}=?$

A) $\frac{4}{5}$ B) $\frac{6}{5}$ C) $\frac{7}{5}$ D) $\frac{8}{5}$ E) $\frac{9}{5}$

3. $2+\cfrac{4}{5-\cfrac{6}{2+\cfrac{8}{x}}}=3 \Rightarrow x=?$

A) 1 B) 2 C) 3 D) 4 E) 5

4. $2+\cfrac{3}{2+\cfrac{3}{2+\cfrac{3}{\vdots}}}=?$

A) 1 B) $\frac{3}{2}$ C) 2 D) $\frac{5}{2}$ E) 3

5. $4+\cfrac{4+\cfrac{4+\cfrac{\vdots}{5}}{5}}{5}=?$

A) 1 B) 2 C) 3 D) 4 E) 5

6. $2-\cfrac{1}{2-\cfrac{1}{2-\cfrac{1}{\vdots}}}=\frac{3}{x-1} \Rightarrow x=?$

A) 1 B) 2 C) 3 D) 4 E) 5

7. $\left(1-\frac{1}{9}\right)\left(1-\frac{1}{16}\right)\left(1-\frac{1}{25}\right)\ldots\left(1-\frac{1}{144}\right)=?$

A) $\frac{1}{3}$
B) $\frac{3}{5}$
C) $\frac{2}{9}$
D) $\frac{5}{18}$
E) $\frac{13}{18}$

8. $\left(1-\frac{1}{3}\right)+\left(2-\frac{1}{3}\right)+\ldots+\left(15-\frac{1}{3}\right)=?$

A) 105
B) 110
C) 115
D) 120
E) 125

9. $A=\frac{1}{2}-\frac{2}{3}+\frac{3}{5}$

$B=\frac{1}{2}+\frac{5}{3}+\frac{2}{5} \Rightarrow A=?$

A) B + 1
B) B – 3
C) 1 – B
D) 3 – B
E) 4 – B

10. $A=\frac{9}{7}+\frac{4}{9}-\frac{5}{11}$

$B=\frac{12}{7}-\frac{13}{9}+\frac{27}{11} \Rightarrow B=?$

A) 1 – A
B) 2 – A
C) 3 – A
D) 4 – A
E) 5 – A

11. $\dfrac{1905\frac{2}{7}-1907\frac{5}{7}}{3+1\frac{6}{7}}=?$

A) $-\frac{1}{2}$
B) -1
C) $-\frac{3}{2}$
D) -2
E) $-\frac{5}{2}$

12. $3+\cfrac{2}{5-\cfrac{x}{3+\cfrac{1}{2-\cfrac{1}{2}}}}=4 \Rightarrow x=?$

A) 9
B) 11
C) 15
D) 18
E) 21

YANITLAR / ANSWERS

1. C	2. B	3. B	4. E	5. E	6. D	7. E	8. C
9. D	10. D	11. A	12. B				

1. $$3-\frac{2+\frac{1}{2-\frac{4}{3}}}{1+\frac{1}{3-\frac{1}{2}}}=?$$

A) -1 B) $-\frac{1}{2}$ C) $\frac{1}{2}$

D) 1 E) $\frac{3}{2}$

2. $$4+\frac{3}{5-\frac{4}{x-\frac{2}{1+\frac{1}{3}}}}=5 \Rightarrow x=?$$

A) $\frac{1}{2}$ B) $\frac{3}{2}$ C) $\frac{5}{2}$

D) $\frac{7}{2}$ E) $\frac{9}{2}$

3. $$1+\frac{x}{2+\frac{x}{1+\frac{x}{2+\frac{x}{\vdots}}}}=4 \Rightarrow x=?$$

A) 12 B) 16 C) 18

D) 20 E) 24

4. $$3+\frac{3+\frac{3+\iddots}{x}}{x}=5 \Rightarrow x=?$$

A) $\frac{1}{2}$ B) $\frac{3}{2}$ C) $\frac{5}{2}$

D) $\frac{7}{2}$ E) $\frac{9}{2}$

5. $$A=\frac{2}{3}-\frac{7}{4}+\frac{9}{5}$$

$$B=-\frac{1}{3}+\frac{1}{4}+\frac{4}{5} \Rightarrow A=?$$

A) 2 – B

B) 1 – B

C) B

D) 1 + B

E) 2 + B

6. $$8+\frac{x}{5+\frac{x}{5+\frac{x}{\ddots}}}=9 \Rightarrow x=?$$

A) 4 B) 5 C) 6

D) 7 E) 8

7. $\left.\begin{array}{l} a=\dfrac{3}{7} \\ b=\dfrac{2}{13} \\ c=\dfrac{4}{17} \end{array}\right\} \Rightarrow\ ?<?<?$

A) $b<a<c$ B) $a<b<c$ C) $c<a<b$
D) $a<c<b$ E) $b<c<a$

8. $\left.\begin{array}{l} a=-\dfrac{2}{5} \\ b=-\dfrac{3}{11} \\ c=-\dfrac{1}{9} \end{array}\right\} \Rightarrow\ ?<?<?$

A) $a<b<c$ B) $b<c<a$ C) $c<a<b$
D) $c<b<a$ E) $a<c<b$

9. $\left.\begin{array}{l} a=-\dfrac{5}{6} \\ b=-\dfrac{4}{3} \\ c=-\dfrac{7}{8} \end{array}\right\} \Rightarrow\ ?<?<?$

A) $a<b<c$ B) $c<a<b$ C) $a<c<b$
D) $b<c<a$ E) $b<a<c$

10. $a,\ b,\ c \in Z^{+}$

$$\frac{25}{7}=a+\cfrac{1}{b+\cfrac{3}{c}} \Rightarrow \mathbf{a+b+c=?}$$

A) 8 B) 9 C) 10
D) 11 E) 12

11. $$\frac{1}{2-\dfrac{2}{a}}+\frac{1}{\dfrac{2}{a}-2}=?$$

A) $-a$ B) -1 C) 0
D) 1 E) a

12. $$5+\cfrac{2}{2+\cfrac{3}{2+\cfrac{3}{2+\cfrac{3}{\ddots}}}}=?$$

A) $\frac{11}{3}$ B) $\frac{13}{3}$ C) $\frac{14}{3}$
D) $\frac{16}{3}$ E) $\frac{17}{3}$

YANITLAR / ANSWERS

1. C 2. D 3. E 4. C 5. C 6. C 7. E 8. A
9. D 10. A 11. C 12. E

1. $\frac{0,6}{0,12} - \frac{3,6}{0,9} + \frac{0,72}{0,018} = ?$

A) 4
B) 12
C) 20
D) 34
E) 41

2. $2^2 + \frac{1}{10} + \frac{3^2}{1000} = ?$

A) 4,019
B) 4,109
C) 4,901
D) 9,401
E) 1,904

3. $\frac{0,3}{0,03} + \frac{0,03}{0,003} - \frac{0,003}{0,0003} = ?$

A) 1
B) 5
C) 10
D) 15
E) 20

4. $\frac{0,63}{0,7} - \frac{3}{0,1} + \frac{0,48}{1,2} = ?$

A) –2,17
B) –2,64
C) –25,4
D) –28,7
E) –32,4

5. $\frac{22,22}{0,22} - \frac{1+0,25}{1-1,25} : \frac{0,2}{0,04} = ?$

A) 90
B) 94
C) 95
D) 100
E) 102

6. $\dfrac{\frac{3}{4}+0,75}{0,125+\frac{23}{8}} = ?$

A) $\frac{1}{2}$ B) 1 C) $\frac{3}{2}$

D) 2 E) $\frac{5}{2}$

7. $\dfrac{2,\overline{3}+4,\overline{5}+7,\overline{2}}{4,\overline{5}-3,\overline{4}-1,\overline{2}}=?$

A) –134
B) –127
C) –113
D) –105
E) –92

8. $x = 0,4 + 0,04 + 0,004 + \ldots\ldots\ldots$

$y=1+\dfrac{3}{10}+\dfrac{3}{100}+\dfrac{3}{1000}+\ldots\ldots$

$\Rightarrow$ **x + y = ?**

A) 1
B) $\dfrac{13}{9}$
C) $\dfrac{14}{9}$
D) $\dfrac{16}{9}$
E) 2

9. $0,\overline{6}+\dfrac{1}{1-\dfrac{1+0,\overline{6}}{0,\overline{6}-\dfrac{1}{0,\overline{6}}}}=?$

A) –1
B) $-\dfrac{1}{2}$
C) $\dfrac{1}{2}$
D) 1
E) $\dfrac{3}{2}$

10. $\dfrac{0,\overline{2}}{2}-\dfrac{3}{0,\overline{3}}+\dfrac{0,\overline{4}}{4}-\dfrac{5}{0,\overline{5}}+18=?$

A) $\dfrac{2}{9}$
B) $\dfrac{5}{9}$
C) $\dfrac{16}{9}$
D) $\dfrac{49}{9}$
E) $\dfrac{74}{9}$

11. $\dfrac{1}{3\cdot4}+\dfrac{1}{4\cdot5}+\ldots+\dfrac{1}{12\cdot13}=\dfrac{10}{39}$

$\Rightarrow \dfrac{13}{6\cdot20}+\dfrac{13}{8\cdot25}+\ldots+\dfrac{13}{24\cdot65}=?$

A) $\dfrac{1}{2}$
B) $\dfrac{2}{3}$
C) $\dfrac{1}{3}$
D) $\dfrac{2}{7}$
E) $\dfrac{1}{17}$

12. $\dfrac{x,\overline{x}+y,\overline{y}}{x,y+y,x}=?$

A) $\dfrac{98}{99}$
B) 1
C) $\dfrac{100}{99}$
D) $\dfrac{101}{99}$
E) $\dfrac{110}{99}$

YANITLAR / ANSWERS

1. E 2. B 3. C 4. D 5. E 6. A 7. B 8. D
9. D 10. A 11. C 12. C

1. $\dfrac{xy0,xy}{0,xy}+\dfrac{x0,x}{0,0x}-\dfrac{xyx,y}{0,xy}=?$

A) 1
B) 10
C) 11
D) 101
E) 1001

2. $(xy,z + zx,y + yz,x)\cdot a = b$

$b \in Z \;\Rightarrow\;$ **min(a) = ?**

A) $\dfrac{11}{10}$
B) $\dfrac{111}{10}$
C) $\dfrac{10}{11}$
D) $\dfrac{10}{111}$
E) $\dfrac{100}{1111}$

3. $\left.\begin{aligned}\dfrac{1}{x^{-1}}+\dfrac{1}{y^{-1}}&=0,\overline{5}\\ x-y&=0,\overline{3}\end{aligned}\right\} \Rightarrow \dfrac{x}{y}=?$

A) 1
B) 2
C) 3
D) 4
E) 5

4. $\dfrac{a,0\overline{a}-b,0\overline{b}}{a,\overline{a}-b,\overline{b}}=?$

A) $\dfrac{33}{100}$
B) $\dfrac{79}{100}$
C) $\dfrac{91}{100}$
D) 1
E) $\dfrac{11}{10}$

5. $a = 3,02$

$b = 3,0\overline{2}$

$c = 3,\overline{02} \;\Rightarrow$ **? < ? < ?**

A) $a < c < b$
B) $a < b < c$
C) $b < c < a$
D) $c < a < b$
E) $b < a < c$

6. $\dfrac{0,3\overline{4}+0,4\overline{5}}{0,\overline{3}+0,2}\cdot(1-0,6)=?$

A) $\dfrac{5}{2}$
B) $\dfrac{3}{2}$
C) 1
D) $\dfrac{3}{4}$
E) $\dfrac{3}{5}$

7. $3,\overline{x} + 4,\overline{x} + 5,\overline{x} = 13 \Rightarrow$ **x = ?**

A) 1 B) 2 C) 3
D) 4 E) 5

8. $\dfrac{x,yz}{xy,z} + \dfrac{xy,z}{0,xyz} \cdot \dfrac{x,yz}{xyz} = ?$

A) 0,1 B) 0,101 C) 1
D) 1,1 E) 1,11

9. $1,\overline{1} + 2,\overline{2} + 3,\overline{3} + \ldots + 9,\overline{9} = ?$

A) 45 B) 50 C) 55
D) 60 E) 65

10. x = 0,7 + 0,07 + 0,007 + ...
y = 0,5 + 0,05 + 0,005 + ...
$\Rightarrow$ **x + y = ?**

A) $\frac{1}{3}$ B) $\frac{2}{3}$ C) 1
D) $\frac{4}{3}$ E) $\frac{5}{3}$

11. $\left.\begin{array}{l} a = 4,34\overline{6} \\ b = 4,3\overline{46} \\ c = 4,\overline{346} \end{array}\right\} \Rightarrow ? < ? < ?$

A) b < c < a B) c < b < a C) c < a < b
D) a < c < b E) a < b < c

12. $\dfrac{a,\overline{a} + a,\overline{aa}}{0,\overline{2}} = 10 \Rightarrow$ **a = ?**

A) 1 B) 2 C) 3
D) 4 E) 5

YANITLAR / ANSWERS

1. E	**2. D**	**3. D**	**4. C**	**5. A**	**6. E**	**7. C**	**8. D**
9. B	**10. D**	**11. B**	**12. A**				

ÜNİTE 2

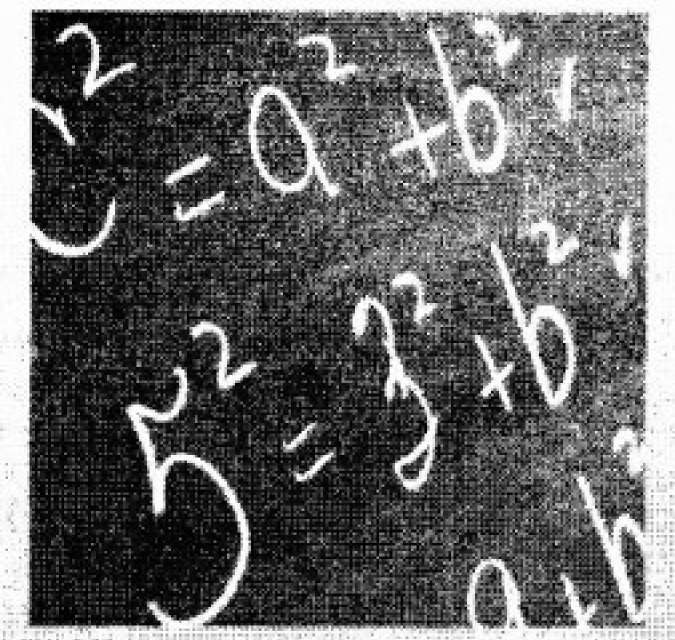
UNIT

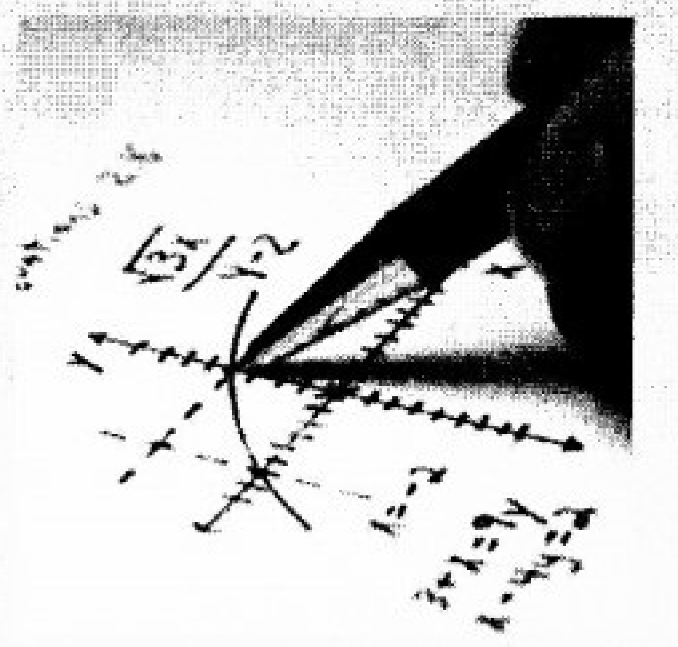
Bu ünitede özdeşlikler ve çarpanlara ayırma ve oran – orantı konusu ayrıntılı anlatılmıştır. Öğrencilerin özdeşlikler bölümünde verilen ifadeleri iyi öğrenmeleri; ikinci dereceden denklem, limit, türev, integral gibi konularda gerekli olacağından önemlidir.

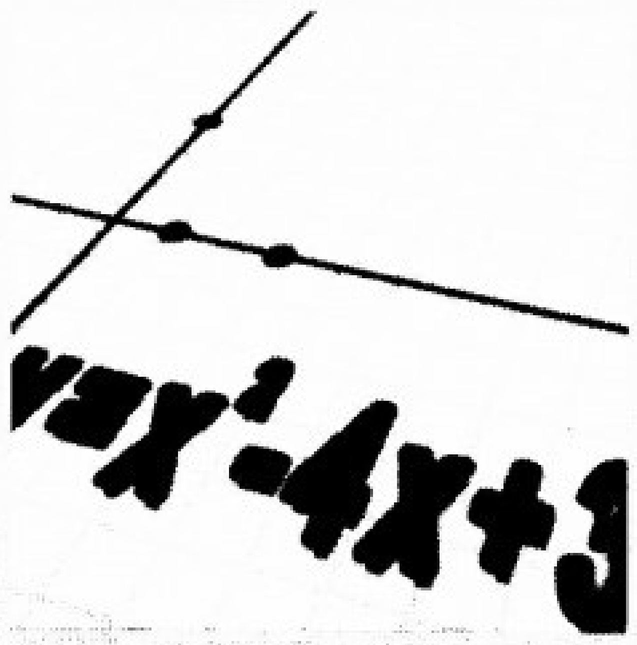
Bu ünite, 67 çözümlü örnek, 24 alıştırma, 96 test sorusu içermektedir.

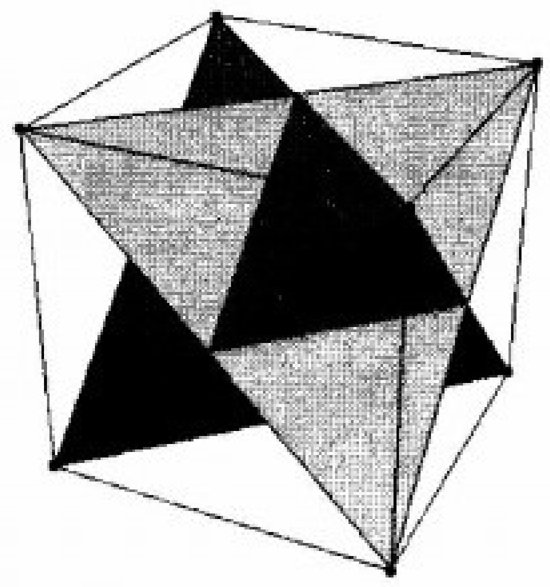
In this unit, identites, factorization and ratio-proportion are explained in detailed. Expressions with identity are very important. Because these expressions are necessary in quadratic equations, limit, derivative, integral.

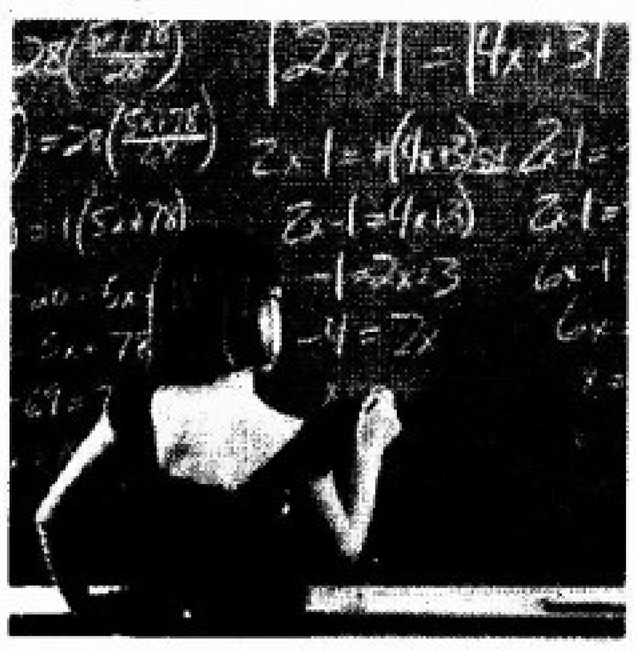
This unit includes; and 96 test questions.











- **ÖZDEŞLİKLER ve ÇARPANLARA AYIRMA**
  IDENTITIES and FACTORIZATION . . . . 71 – 100

- **ORAN ve ORANTI / *RATIOS and PROPORTIONS*** . . . . 101 – 120

1. $x > y,$

$$x + y - 2\sqrt{xy} = 4 \Rightarrow \frac{\sqrt{x} + \sqrt{y}}{x - y} = ?$$

A) $\frac{1}{2}$ B) 2 C) 4

D) 8 E) 16

2. $x = 4$

$y = 3 \Rightarrow x^3 - 6x^2y + 12xy^2 - 8y^3 = ?$

A) –36 B) –27 C) –18

D) –9 E) –8

3. $$\left.\begin{aligned} x + \frac{1}{y} &= \frac{10}{3} \\ x^2 - \frac{1}{y^2} &= \frac{80}{9} \end{aligned}\right\} \Rightarrow x = ?$$

A) $\frac{3}{2}$ B) 3 C) 6

D) 12 E) 24

4. $\frac{1}{x} + \frac{1}{y} = 4$

$x \cdot y = 3 \Rightarrow (x - y)^2 = ?$

A) 96 B) 108 C) 120

D) 132 E) 144

5. $x > y,$

$x + y = 8$

$x^2 + y^2 = 40 \Rightarrow x - y = ?$

A) 1 B) 2 C) 3

D) 4 E) 5

6. $x - y = 5$

$x \cdot y = 2 \Rightarrow x^3 - y^3 = ?$

A) 155 B) 160 C) 165

D) 170 E) 175

7. $x-\frac{5}{x}=4 \;\Rightarrow\; x^3-\frac{125}{x^3}=?$

A) 120
B) 124
C) 125
D) 126
E) 130

8. $\left.\begin{aligned} a^2+b^2+c^2&=29 \\ a+b+c&=9 \end{aligned}\right\} \Rightarrow ab+ac+bc=?$

A) 26
B) 30
C) 38
D) 40
E) 45

9. $4a^2+\frac{1}{4a^2}=18 \;\Rightarrow\; 2a-\frac{1}{2a}=?$

A) 1
B) 3
C) 4
D) 8
E) 12

10. $x, y \in Z^+$

$$\left.\begin{aligned} x^2&=63+xy \\ y^2&=xy-14 \end{aligned}\right\} \Rightarrow x=?$$

A) 7
B) 8
C) 9
D) 10
E) 11

11. $\left.\begin{aligned} a&=\sqrt{5}-1 \\ b&=\sqrt{5}+1 \end{aligned}\right\} \Rightarrow \frac{(a+b)^2-2ab}{\frac{a}{b}+\frac{b}{a}}=?$

A) 4
B) 10
C) 18
D) 20
E) 24

12. $4^x+4^{-x}=3 \;\Rightarrow\; 16^x+16^{-x}=?$

A) 5
B) 7
C) 9
D) 11
E) 13

YANITLAR / ANSWERS

1. A	2. E	3. B	4. D	5. D	6. A	7. B	8. A
9. C	10. C	11. A	12. B				

1. $x+y-2\sqrt{xy}=(\sqrt{x}-\sqrt{y})^2=4$

$$x>y \Rightarrow \sqrt{x}-\sqrt{y}=2$$

$$\frac{\sqrt{x}+\sqrt{y}}{x-y}=\frac{\sqrt{x}+\sqrt{y}}{(\sqrt{x}+\sqrt{y})\cdot(\sqrt{x}-\sqrt{y})}$$

$$=\frac{1}{\sqrt{x}-\sqrt{y}}=\frac{1}{2}$$

Yanıt / The Answer is A

2. $x^3-6x^2y+12xy^2-8y^3=(x-2y)^3$

$$\left.\begin{array}{l}x=4\\y=3\end{array}\right\} \Rightarrow (4-2\cdot 3)^3=-8$$

Yanıt / The Answer is E

3. $x^2-\frac{1}{y^2}=\left(x-\frac{1}{y}\right)\cdot\left(x+\frac{1}{y}\right)=\frac{80}{9}$

$$x+\frac{1}{y}=\frac{10}{3} \Rightarrow \left(x-\frac{1}{y}\right)\cdot\frac{10}{3}=\frac{80}{9}$$

$$x-\frac{1}{y}=\frac{8}{3}$$

$$\left.\begin{array}{l}x+\frac{1}{y}=\frac{10}{3}\\[4pt] x-\frac{1}{y}=\frac{8}{3}\end{array}\right\} \Rightarrow \begin{array}{l}2x=6\\x=3\end{array}$$

Yanıt / The Answer is B

4. $\frac{1}{x}+\frac{1}{y}=\frac{x+y}{xy}=4$

$x+y=4\cdot(xy) \Rightarrow x+y=4\cdot 3=12$

$(x-y)^2=(x+y)^2-4xy$

$(x-y)^2=144-12=132$

Yanıt / The Answer is D

5. $x^2+y^2=(x+y)^2-2xy=40$

$8^2-2xy=40$

$64-2xy=40$

$2xy=64-40$

$2xy=24$

$xy=12$

$(x-y)^2=x^2-2xy+y^2$

$(x-y)^2=40-24=16$

$x-y=4$

Yanıt / The Answer is D

6. $x^3-y^3=(x-y)^3+3xy(x-y)$

$x^3-y^3=5^3+3\cdot 2\cdot(5)$

$x^3-y^3=125+30=155$

Yanıt / The Answer is A

7. $x^3-\frac{125}{x^3}=\left(x-\frac{5}{x}\right)^3+3\cdot x\cdot\frac{5}{x}\cdot\left(x-\frac{5}{x}\right)$

$x^3-\frac{125}{x^3}=4^3+15\cdot 4$

$=64+60=124$

Yanıt / The Answer is B

8. $a+b+c=9 \Rightarrow (a+b+c)^2=9^2$

$\underbrace{a^2+b^2+c^2}_{29}+2\cdot(ab+ac+bc)=81$

$29+2\cdot(ab+ac+bc)=81$

$\frac{2\cdot(ab+ac+bc)}{2}=\frac{52}{2}$

$ab+ac+bc=26$

Yanıt / The Answer is A

9. $2a-\frac{1}{2a}=x$

$\left(2a-\frac{1}{2a}\right)^2=x^2 \Rightarrow 4a^2-2\cdot 2a\frac{1}{2a}+\frac{1}{4a^2}=x^2$

$4a^2-2+\frac{1}{4a^2}=x^2$

$18-2=x^2$

$16=x^2$

$x^2=16 \Rightarrow x=2a-\frac{1}{2a}=4$

Yanıt / The Answer is C

10. $\left.\begin{aligned}x^2&=63+xy\\ y^2&=xy-14\end{aligned}\right\} \Rightarrow \quad x^2+y^2=49+2xy$

$x^2-2xy+y^2=49$

$(x-y)^2=49$

$x-y=7$

$\left.\begin{aligned}x^2&=63+xy\\ y^2&=xy-14\end{aligned}\right\} \Rightarrow \quad x^2-y^2=77$

$(x-y)\cdot(x+y)=77$

$x-y=7 \Rightarrow 7\cdot(x+y)=77$

$x+y=11$

$\left.\begin{aligned}x-y&=7\\ x+y&=11\end{aligned}\right\} \Rightarrow x=9$

Yanıt / The Answer is C

11. $\frac{(a+b)^2-2ab}{\frac{a}{b}+\frac{b}{a}}=\frac{a^2+2ab+b^2-2ab}{\frac{a^2+b^2}{ab}}$

$=\frac{(a^2+b^2)\cdot ab}{a^2+b^2}=ab$

$\left.\begin{aligned}a&=\sqrt{5}-1\\ b&=\sqrt{5}+1\end{aligned}\right\} \Rightarrow a\cdot b=(\sqrt{5}-1)\cdot(\sqrt{5}+1)=4$

Yanıt / The Answer is A

12. $16^x+16^{-x}=4^{2x}+4^{-2x}$

$4^{2x}+4^{-2x}=(4^x+4^{-x})^2-2\cdot 4^x\cdot 4^{-x}$

$=3^2-2\cdot 1$

$=7$

Yanıt / The Answer is B

1. $a + c = 4$

$c - b = 5 \Rightarrow ab - bc - ac + b^2 = ?$

A) 20

B) 5

C) 0

D) –5

E) –20

2. $\dfrac{a^3 + a^2b - ac^2 - bc^2}{a^2 - ac + ab - bc} = ?$

A) a + c

B) a + b

C) b + c

D) a – c

E) a – b

3. $\dfrac{x^2 + mx + n}{x^2 + 7x + 12} \cdot \dfrac{x^2 + 6x + 8}{x^2 - 4} = \dfrac{x + 5}{x + 3} \Rightarrow m \cdot n = ?$

A) –42

B) –30

C) –28

D) –24

E) –18

4. $\dfrac{x^2 - 1}{x^2 - 2x - 3} : \dfrac{x - 1}{x - 3} = ?$

A) x – 2

B) x – 3

C) 1

D) x + 1

E) x + 3

5. $\left.\begin{array}{l} 2a^2 + 3ab + b^2 = 10 \\ a + b = 2 \end{array}\right\} \Rightarrow b = ?$

A) –1

B) 0

C) 1

D) 2

E) 3

6. $\left(\dfrac{x^2 - 3x + 2}{x^2 - 1} : \dfrac{x^2 - x - 20}{x^2 + 4x}\right) : \dfrac{x - 2}{x^2 - 4x - 5} = ?$

A) x

B) x – 1

C) x + 1

D) x – 2

E) x + 2

7. $\left(x+\frac{1}{x^2}\right):\left(1-\frac{1}{x}+\frac{1}{x^2}\right)=?$

A) x

B) $x+1$

C) $x-1$

D) $\frac{1}{x}$

E) $\frac{1}{x+1}$

8. $\left(a-\frac{1}{a}\right):\left(\frac{a^2-2a-3}{3a-a^2}\right)=?$

A) $3-a$

B) $2-a$

C) $1-a$

D) $1+a$

E) $2+a$

9. $\frac{x^4-3x^2-4}{x^4-1}\cdot\frac{x^2-2x-3}{x^2+x-6}\cdot\frac{x-1}{x+2}=?$

A) $\frac{x+1}{x-1}$

B) $\frac{x-2}{x+2}$

C) $\frac{x-3}{x+3}$

D) $\frac{x-2}{x+1}$

E) $\frac{x+3}{x-1}$

10. $\frac{x-\frac{1}{x^2}}{\frac{1}{x}+x+1}:\frac{x-1}{x^2}=?$

A) $\frac{1}{x^2}$

B) $\frac{1}{x}$

C) 1

D) x

E) x^2

11. $\frac{5^{20}-3^{20}}{5^{15}+5^{10}\cdot 3^5+5^5\cdot 3^{10}+3^{15}}+3^5=x^5 \Rightarrow x=?$

A) 3

B) 4

C) 5

D) 6

E) 7

12. $\frac{(a+b)^2-11\cdot(a+b)+28}{a+b-4}=?$

A) $a+b-7$

B) $a+b+7$

C) $a-b-7$

D) $a+7$

E) $a-7$

YANITLAR / ANSWERS

1. B	2. A	3. B	4. C	5. A	6. A	7. B	8. C
9. C	10. D	11. C	12. A				

1. $ab - bc - ac + b^2 = ab - ac + b^2 - bc$

$$= a(b - c) + b(b - c)$$

$$= (b - c) \cdot (a + b)$$

$$\left.\begin{aligned} a+c&=4 \\ c-b&=5 \end{aligned}\right\} \Rightarrow a+b=-1$$

$$b-c=-5$$

$\Rightarrow (b - c)\cdot(a + b) = -1 \cdot -5 = 5$

Yanıt / The Answer is B

---

2. $$\frac{a^3+a^2b-ac^2-bc^2}{a^2-ac+ab-bc} = \frac{a^2(a+b)-c^2(a+b)}{a(a-c)+b(a-c)}$$

$$= \frac{(a+b)\cdot(a-c)\cdot(a+c)}{(a-c)\cdot(a+b)}$$

$$= a+c$$

Yanıt / The Answer is A

---

3. $$\frac{x^2+mx+n}{x^2+7x+12} \cdot \frac{x^2+6x+8}{x^2-4} = \frac{x+5}{x+3}$$

$$\frac{x^2+mx+n}{x^2+7x+12} \cdot \frac{(x+2)\cdot(x+4)}{(x-2)\cdot(x+2)} = \frac{x+5}{x+3}$$

$$\frac{x^2+mx+n}{(x+4)\cdot(x+3)} \cdot \frac{x+4}{x-2} = \frac{x+5}{x+3}$$

$\Rightarrow x^2 + mx + n = x^2 + 3x - 10$

$\Rightarrow m = 3,\ n = -10 \Rightarrow m\cdot n = 3\cdot(-10) = -30$

Yanıt / The Answer is B

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4. $$\frac{x^2-1}{x^2-2x-3} : \frac{x-1}{x-3} = \frac{(x-1)\cdot(x+1)}{(x-3)\cdot(x+1)} \cdot \frac{x-3}{x-1}$$

$$= 1$$

Yanıt / The Answer is C

---

5. $2a^2 + 3ab + b^2 = 10$

$(2a + b)\cdot(a + b) = 10$

$a + b = 2 \Rightarrow 2a + b = 5$

$$\left.\begin{aligned} 2a+b&=5 \\ a+b&=2 \end{aligned}\right\} \Rightarrow b=-1$$

Yanıt / The Answer is A

---

6. $$\left(\frac{x^2-3x+2}{x^2-1} : \frac{x^2-x-20}{x^2+4x}\right) : \frac{x-2}{x^2-4x-5}$$

$$= \left(\frac{(x-2)\cdot(x-1)}{(x-1)\cdot(x+1)} \cdot \frac{x\cdot(x+4)}{(x-5)\cdot(x+4)}\right) \cdot \frac{(x-5)\cdot(x+1)}{(x-2)}$$

$$= x$$

Yanıt / The Answer is A

7. $\left(x+\frac{1}{x^2}\right):\left(1-\frac{1}{x}+\frac{1}{x^2}\right)=\left(\frac{x^3+1}{x^2}\right):\left(\frac{x^2-x+1}{x^2}\right)$

$$=\frac{(x+1)\cdot(x^2-x+1)}{x^2}\cdot\frac{x^2}{x^2-x+1}$$

$$=x+1$$

Yanıt / The Answer is B

---

8. $\left(a-\frac{1}{a}\right):\left(\frac{a^2-2a-3}{3a-a^2}\right)=\left(\frac{a^2-1}{a}\right):\left(\frac{(a-3)\cdot(a+1)}{a(3-a)}\right)$

$$=\frac{(a-1)\cdot(a+1)}{a}\cdot\frac{a\cdot(3-a)}{(a-3)\cdot(a+1)}$$

$$=1-a$$

Yanıt / The Answer is C

---

9. $\frac{x^4-3x^2-4}{x^4-1}\cdot\frac{x^2-2x-3}{x^2+x-6}\cdot\frac{x-1}{x+2}$

$$=\frac{(x^2-4)\cdot(x^2+1)}{(x^2-1)\cdot(x^2+1)}\cdot\frac{(x-3)\cdot(x+1)}{(x+3)\cdot(x-2)}\cdot\frac{x-1}{x+2}$$

$$=\frac{(x-2)\cdot(x+2)}{(x-1)\cdot(x+1)}\cdot\frac{(x-3)\cdot(x+1)}{(x+3)\cdot(x-2)}\cdot\frac{x-1}{x+2}$$

$$=\frac{x-3}{x+3}$$

Yanıt / The Answer is C

---

10. $\frac{x-\frac{1}{x^2}}{\frac{1}{x}+x+1}:\frac{x-1}{x^2}=\frac{\frac{x^3-1}{x^2}}{\frac{1+x^2+x}{x}}\cdot\frac{x^2}{x-1}$

$$=\frac{(x-1)\cdot(x^2+x+1)}{x\cdot(x^2+x+1)}\cdot\frac{x^2}{x-1}$$

$$=x$$

Yanıt / The Answer is D

---

11. $\frac{(5^5)^4-(3^5)^4}{5^{15}+5^{10}\cdot3^5+5^5\cdot3^{10}+3^{15}}+3^5=x^5$

$$\frac{(5^5-3^5)\ (5^{15}+5^{10}\cdot3^5+5^5\cdot3^{10}+3^{15})}{5^{15}+5^{10}\cdot3^5+5^5\cdot3^{10}+3^{15}}+3^5=x^5$$

$$5^5-3^5+3^5=x^5\Rightarrow 5^5=x^5\Rightarrow x=5$$

Yanıt / The Answer is C

---

12. $\frac{(a+b)^2-11\cdot(a+b)+28}{a+b-4}=\frac{(a+b-4)\ (a+b-7)}{a+b-4}$

$$=a+b-7$$

Yanıt / The Answer is A

1. $\dfrac{ab+ac-b^2-bc}{b+c}=?$

Yanıt / The Answer is: **a – b**

2. $x+1-2\sqrt{x+1}-3=0 \Rightarrow x=?$

Yanıt / The Answer is: **8**

3. $1+a=\dfrac{a}{b} \Rightarrow \dfrac{a^2b+ab^2}{b^2-a^2}=?$

Yanıt / The Answer is: **–1**

4. $\left(\dfrac{x^4-29x^2+100}{x^2-7x+10}\right):(x+5)=?$

Yanıt / The Answer is: **x + 2**

5. $\dfrac{x^2+3x-10}{2x^2+ax+b}=\dfrac{x-2}{2x-3} \Rightarrow a+b=?$

Yanıt / The Answer is: **–8**

6. $\dfrac{2}{x-2}-\dfrac{x}{x^2-4}\cdot\dfrac{x^2-x-6}{x-3}=?$

Yanıt / The Answer is: **–1**

7. $\dfrac{25^x-64^x}{5^x-8^x}=625+8^x \Rightarrow x=?$

Yanıt / The Answer is: **4**

8. $\left.\begin{array}{l}\dfrac{1}{x}+\dfrac{1}{y}=5\\ x\cdot y=3\end{array}\right\} \Rightarrow (x-y)^2=?$

Yanıt / The Answer is: **213**

9. $\dfrac{2x^2+7x-4}{x^2+8x+15}:\dfrac{2x^2-5x+2}{x^2+x-6}=?$

Yanıt / The Answer is: $\dfrac{x+4}{x+5}$

10. $\dfrac{a^2-3a+ab-3b}{3-a}+a=?$

Yanıt / The Answer is: **–b**

11. $\left.\begin{array}{l}\dfrac{1}{x}-\dfrac{1}{y}=3\\ x\cdot y=\dfrac{1}{18}\end{array}\right\} \Rightarrow (x-y)^2=?$

Yanıt / The Answer is: $\dfrac{1}{36}$

12. $\dfrac{x^2+2x-15}{x^2+mx+n}=\dfrac{x+5}{x-4} \Rightarrow m+n=?$

Yanıt / The Answer is: **5**

1. $\left(\frac{x+3}{3-x}\right):\left(1+\frac{6}{x-3}\right)=?$

A) –3 B) –2 C) –1 D) 1 E) 2

2. $\frac{x}{x^2+x^3}:\frac{1-\frac{1}{x}}{x-\frac{1}{x}}=?$

A) x^2 B) x C) $\frac{1}{x}$ D) $-\frac{1}{x}$ E) $-\frac{1}{x^2}$

3. $\left.\begin{array}{l}\sqrt{x}+\sqrt{y}=4\\ x-y=8\end{array}\right\}\Rightarrow x+y=?$

A) 3 B) 4 C) 6 D) 8 E) 10

4. $\left.\begin{array}{l}a=2{,}6\\ b=7{,}4\end{array}\right\}\Rightarrow \frac{(a-b)^2+4ab}{5a+5b}=?$

A) 1 B) $\frac{3}{2}$ C) 2 D) $\frac{5}{2}$ E) 3

5. $\frac{2x^2+8y^2}{(x-2y)^2+(x+2y)^2}=?$

A) 1 B) 2 C) 3 D) 4 E) 5

6. $x^2-12x+3=0 \Rightarrow \frac{x}{3}+\frac{1}{x}=?$

A) 3 B) 4 C) 5 D) 6 E) 8

7. $\left.\begin{array}{l} x\cdot y=3 \\ x-2y=2 \end{array}\right\} \Rightarrow \mathbf{x^3-8y^3=?}$

A) 41　B) 42　C) 43　D) 44　E) 45

8. $a-\dfrac{1}{a}=5 \Rightarrow \mathbf{a^2-\dfrac{1}{a^2}=?}$

A) $\sqrt{29}$　B) $2\sqrt{29}$　C) $3\sqrt{29}$　D) $4\sqrt{29}$　E) $5\sqrt{29}$

9. $\dfrac{\mathbf{x^3-y^3}}{\mathbf{x^2+y^2+xy}} : \dfrac{\mathbf{(x^2+y^2-xy)(x-y)}}{\mathbf{x^3+y^3}} = \mathbf{?}$

A) x　B) $x+y$　C) $x-y$　D) $\dfrac{1}{x+y}$　E) $\dfrac{1}{x-y}$

10. $x+\dfrac{1}{x}=4\sqrt{2} \Rightarrow \mathbf{x-\dfrac{1}{x}=?}$

A) $5\sqrt{2}$　B) $\sqrt{6}$　C) $2\sqrt{6}$　D) $\sqrt{7}$　E) $2\sqrt{7}$

11. $9x^2-12x+1=0 \Rightarrow \mathbf{9x^2+\dfrac{1}{9x^2}=?}$

A) 14　B) 15　C) 18　D) 21　E) 24

12. $\left.\begin{array}{l} a+b-c=4 \\ a^2+b^2+c^2=6 \end{array}\right\} \Rightarrow \mathbf{ac+bc-ab=?}$

A) –1　B) –2　C) –3　D) –4　E) –5

YANITLAR / ANSWERS

1. C	2. C	3. E	4. C	5. A	6. B	7. D	8. E
9. B	10. E	11. A	12. E				

1. $(2x+1)^2 - 2(2x+1) - 15 = 0 \Rightarrow \sum x = ?$

A) –2 B) –1 C) 0

D) 1 E) 2

2. $x^2 - 4x + 4y^2 + 12y + 13 = 0 \Rightarrow x + y = ?$

A) $\frac{1}{2}$ B) 1 C) $\frac{3}{2}$

D) 2 E) $\frac{5}{2}$

3. $\frac{x^2+mx+n}{x^2-7x+10} = \frac{x+1}{x-5} \Rightarrow m+n = ?$

A) 0 B) –1 C) –2

D) –3 E) –4

4. $x^2 + \frac{9}{x^2} = 6 \Rightarrow x + \frac{3}{x} = ?$

A) $-\sqrt{3}$ B) $\sqrt{3}$ C) $2\sqrt{3}$

D) $3\sqrt{3}$ E) $4\sqrt{3}$

5. $\left(\frac{a^3+a^2b+ab^2+b^3}{a^5b-ab^5}\right) : \frac{a+b}{a^2-b^2} = ?$

A) $\frac{1}{a}$ B) $\frac{1}{b}$ C) $\frac{1}{ab}$

D) $\frac{1}{a+b}$ E) $\frac{1}{a-b}$

6. $\left.\begin{array}{l} x\sqrt{x}+y\sqrt{y}=65 \\ x\sqrt{y}+y\sqrt{x}=20 \end{array}\right\} \Rightarrow \sqrt{x}+\sqrt{y} = ?$

A) 3 B) 5 C) 6

D) 7 E) 9

7. $x^2 + x + 1 = 0 \Rightarrow \mathbf{x^6 + 1 = ?}$

A) 2　B) x　C) x + 1　D) x − 1　E) 2x

8. a, b ∈ Z,

$a^2 - b^2 = 19 \Rightarrow \mathbf{a + 2b = ?}$

A) 18　B) 28　C) 38　D) 48　E) 58

9. $x + \frac{1}{x} = 2 \Rightarrow x^{64} + \frac{1}{x^{64}} = ?$

A) 2　B) 2^2　C) 2^8　D) 2^{16}　E) 2^{32}

10. $2a^2 + ab - 3b^2 = 8$,

$a - b = 2 \Rightarrow \mathbf{a \cdot b = ?}$

A) 10　B) 6　C) 3　D) 0　E) −3

11. $\dfrac{x + x^{-2}}{1 - x^{-1} + x^{-2}} : (1 + x^{-1}) = ?$

A) x　B) x + 1　C) x − 1　D) $x^2 + 1$　E) $x^2 + 2$

12. $3x^2 - 6x + 4 = 9 \Rightarrow x - \frac{5}{3x} = ?$

A) $\frac{1}{3}$　B) $\frac{2}{3}$　C) 1　D) 2　E) 3

YANITLAR / ANSWERS

1. C	2. A	3. D	4. C	5. C	6. B	7. A	8. B
9. A	10. D	11. A	12. D				

1. $5x^2 + 4x + 4 + 9y^2 + 12xy = 0 \Rightarrow \mathbf{x \cdot y = ?}$

A) $-\frac{10}{3}$

B) $-\frac{8}{3}$

C) $-\frac{5}{3}$

D) $-\frac{4}{3}$

E) $-\frac{2}{3}$

2. $\frac{x^2+mx+n}{x^2+x-12}=\frac{x+1}{x+4} \Rightarrow \mathbf{m \cdot n = ?}$

A) 6

B) 8

C) 9

D) 12

E) 16

3. $(x^2 + 7x)^2 - 2(x^2+7x) - 48 = (x + a)(x + b)(x + c)(x + d)$

$\Rightarrow \mathbf{a + b + c + d = ?}$

A) 11

B) 12

C) 13

D) 14

E) 15

4. $\left(\frac{x^2+4x}{x^2-x-20}:\frac{x^2-1}{x^2-3x+2}\right):\frac{x-2}{x^2-4x-5}=?$

A) $x^2 + 1$

B) $x - 1$

C) $x + 1$

D) x

E) 1

5. $\frac{x-y}{x+y+2\sqrt{xy}}=\frac{1}{2} \Rightarrow \frac{x}{y}=?$

A) 1

B) 2

C) 3

D) 8

E) 9

6. $\frac{a^3+(a-b)^5+(b-a)^5+b^3}{a^2-ab+b^2}=?$

A) $a + b$

B) $a - b$

C) $2a$

D) $2b$

E) $\frac{1}{a+b}$

7. $x = (2^{32}+1)\cdot(2^{16}+1)\cdot(2^{8}+1)\cdot(2^{4}+1) \Rightarrow \mathbf{2^{64} = ?}$

A) $4x + 4$

B) $6x + 1$

C) $8x + 5$

D) $12x + 3$

E) $15x + 1$

8. $x^2 + x + 1 = 0 \Rightarrow \mathbf{x^5 + 1 = ?}$

A) $-x - 2$

B) $-x - 1$

C) $-x$

D) x

E) $x + 1$

9. $4x^2 + y^2 - 4x + 8y + 17 = 0 \Rightarrow \mathbf{x \cdot y = ?}$

A) 3

B) 2

C) 1

D) –1

E) –2

10. $\left.\begin{array}{l} x^2+y^2=292 \\ (x-2)^2+(y-2)^2=260 \end{array}\right\} \Rightarrow \mathbf{x+y=?}$

A) 6

B) 7

C) 8

D) 9

E) 10

11. $\left(\dfrac{x^2}{x+2}-1\right)\cdot\left(\dfrac{y-2x}{2x^2+2x-xy-y}\right)\cdot\left(\dfrac{x^2-5x-14}{x-2}\right)=?$

A) $7 - x$

B) $6 - x$

C) $5 - x$

D) $x - 6$

E) $x - 7$

12. $x, y \in \mathbb{R} \Rightarrow \mathbf{\min(x^2 + y^2 - 2x + 6y) = ?}$

A) –8

B) –9

C) –10

D) –11

E) –12

YANITLAR / ANSWERS

1. B 2. A 3. D 4. D 5. E 6. A 7. E 8. C
9. E 10. E 11. A 12. C

1. $3^x - 3^{-x} = 4 \Rightarrow 27^x - 27^{-x} = ?$

A) 76

B) 80

C) 81

D) 84

E) 90

2. $\left(\dfrac{a\sqrt{a}+1}{a-\sqrt{a}+1}-1\right)^2 = ?$

A) a

B) $a + 1$

C) a^2

D) $(a + 1)^2$

E) $(a - 1)^2$

3. $a^2+5a-1=0 \Rightarrow a^2+\dfrac{1}{a^2}=?$

A) 25

B) 27

C) 30

D) 36

E) 40

4. $2^{\frac{1}{5}}+2=a \Rightarrow \dfrac{\left(2^{\frac{1}{10}}+1\right)\cdot\left(2^{\frac{1}{10}}-1\right)}{2^{\frac{2}{5}}-1}=?$

A) $\dfrac{1}{a+2}$

B) $\dfrac{1}{a+1}$

C) $\dfrac{1}{a}$

D) $\dfrac{1}{a-1}$

E) $\dfrac{1}{a-2}$

5. $x-\dfrac{3}{x}=5 \Rightarrow 3\cdot\left(\dfrac{x^2}{3}+\dfrac{3}{x^2}\right)=?$

A) 23

B) 25

C) 27

D) 29

E) 31

6. $x = 6 - y \Rightarrow$

$$\frac{x^2-y^2-6y-9}{x^2-y^2-3x-3y}=?$$

A) $\dfrac{1}{2}$

B) 1

C) $\dfrac{3}{2}$

D) 2

E) $\dfrac{5}{2}$

7. $x+y+2\sqrt{xy}=12 \Rightarrow \dfrac{x-y}{4\sqrt{x}-4\sqrt{y}}=?$

A) $\dfrac{\sqrt{3}}{2}$

B) $\dfrac{\sqrt{3}}{3}$

C) $\dfrac{\sqrt{3}}{4}$

D) $\dfrac{\sqrt{3}}{6}$

E) $\dfrac{\sqrt{3}}{8}$

8. $\dfrac{1}{x}+\dfrac{1}{y}=\dfrac{3}{4}$

$x+y=6 \Rightarrow x^2+y^2=?$

A) 15

B) 16

C) 18

D) 20

E) 24

9. $x=\sqrt[4]{7} \Rightarrow (x^4+1)\cdot(x^2+1)\cdot(x-1)\cdot(x+1)=?$

A) 48

B) 49

C) 50

D) 54

E) 63

10. $\dfrac{4^x-1}{2^x-1}\cdot\dfrac{3\cdot 2^x-1}{3\cdot 2^{2x}+2\cdot 2^x-1}=?$

A) 2^{x+3}

B) 2^{x+2}

C) 2^{x+1}

D) 2^x

E) 1

11. $\left.\begin{array}{l} x^2+xyz=18 \\ y+\dfrac{x}{z}=\dfrac{1}{2} \end{array}\right\} \Rightarrow x\cdot z=?$

A) 9

B) 18

C) 36

D) 54

E) 72

12. $a+\sqrt{a}=2 \Rightarrow a+\dfrac{1}{\sqrt{a}}=?$

A) –1

B) 1

C) 2

D) 3

E) 4

YANITLAR / ANSWERS

1. A	2. A	3. B	4. D	5. E	6. C	7. A	8. D
9. A	10. E	11. C	12. C				

1. $\frac{x}{2}=\frac{y}{5}=\frac{z}{7}$,

$3x-2y+z=6 \Rightarrow \mathbf{x+y=?}$

A) 12 B) 13 C) 14

D) 15 E) 16

2. $\frac{a}{3}=2b=\frac{c}{4}$,

$a+b+c=75 \Rightarrow \mathbf{b=?}$

A) 3 B) 5 C) 12

D) 25 E) 30

3. $\frac{a}{2}=\frac{b}{3}=\frac{c}{4}$,

$a+b+c=36 \Rightarrow \mathbf{a+c=?}$

A) 22 B) 24 C) 26

D) 28 E) 30

4. $3x=5y=6z$,

$x+y+2z=520 \Rightarrow \mathbf{x=?}$

A) 100 B) 150 C) 200

D) 250 E) 300

5. $\frac{a+b}{4}=\frac{a^2-b^2}{8}=\frac{16}{a-b} \Rightarrow \mathbf{a=?}$

A) 12 B) 15 C) 17

D) 18 E) 20

6. $\frac{x}{y}=\frac{3}{5}$, $\frac{y}{z}=\frac{4}{3} \Rightarrow \mathbf{\frac{2x+y}{x+2z}=?}$

A) $\frac{20}{19}$ B) $\frac{21}{20}$ C) $\frac{22}{21}$

D) $\frac{23}{22}$ E) $\frac{24}{23}$

7. $$\left.\begin{aligned} x+\frac{3}{y}&=5 \\ y+\frac{3}{x}&=2 \end{aligned}\right\} \Rightarrow \frac{\mathbf{x+y}}{\mathbf{2y-x}}=\mathbf{?}$$

A) –7 B) –3 C) 1

D) 3 E) 7

8. $$\frac{a}{b}=\frac{c}{d}=\frac{e}{f}=\frac{3}{2} \Rightarrow \frac{\mathbf{a^2}}{\mathbf{d^2}}\cdot\frac{\mathbf{f}}{\mathbf{e}}\cdot\frac{\mathbf{c^2}}{\mathbf{b^2}}=\mathbf{?}$$

A) $\frac{1}{5}$ B) $\frac{27}{8}$ C) $\frac{1}{3}$

D) $\frac{20}{9}$ E) $\frac{9}{2}$

9. $\frac{x}{a}=\frac{y}{b}=\frac{z}{c}=\frac{5}{3}$

$3x + y + 2z = 20,$

$b + 2c = 3$ ⇒ $\mathbf{x = ?}$

A) 1 B) 2 C) 3

D) 4 E) 5

10. $3x = 5y = a\cdot z = 12$

$\frac{1}{x}+\frac{1}{y}+\frac{1}{z}=1 \Rightarrow \mathbf{a=?}$

A) 7 B) 6 C) 5

D) 4 E) 3

11. $\frac{x+y}{4}=\frac{y+z}{5}=\frac{x+z}{7}$

$y=3 \Rightarrow \mathbf{x=?}$

A) 4 B) 5 C) 6

D) 8 E) 9

12. $\frac{x+y}{y}\cdot(x-1)=k$

$x=2 \Rightarrow y=3$

$x=3 \Rightarrow \mathbf{y=?}$

A) –12 B) –15 C) –16

D) –18 E) –20

YANITLAR / ANSWERS							
1. C	**2. B**	**3. B**	**4. C**	**5. C**	**6. C**	**7. A**	**8. B**
9. E	**10. D**	**11. E**	**12. D**				

1. $\frac{x}{2}=\frac{y}{5}=\frac{z}{7}=k$

$$\left.\begin{array}{l} x=2k \\ y=5k \\ z=7k \end{array}\right\} \Rightarrow \begin{array}{r} 3x-2y+z=6 \\ 6k-10k+7k=6 \\ 3k=6 \\ k=2 \end{array}$$

$k=2 \Rightarrow x+y=7k=7\cdot 2=14$

Yanıt / The Answer is C

---

2. $\frac{a}{3}=2b=\frac{c}{4}=k$

$$\left.\begin{array}{l} a=3k \\ b=\frac{k}{2} \\ c=4k \end{array}\right\} \Rightarrow \begin{array}{r} a+b+c=75 \\ 3k+\frac{k}{2}+4k=75 \\ 15k=150 \\ k=10 \end{array}$$

$\Rightarrow b=\frac{k}{2}=\frac{10}{2}=5$

Yanıt / The Answer is B

---

3. $\frac{a}{2}=\frac{b}{3}=\frac{c}{4} \Rightarrow a=2k\ ,\ b=3k\ ,\ c=4k$

$a+b+c=36$

$2k+3k+4k=36$

$9k=36$

$k=4$

$a+c=2k+4k=6k=6\cdot 4=24$

Yanıt / The Answer is B

---

4. $3x=5y=6z \Rightarrow x=10k,\ y=6k,\ z=5k$

$x+y+2z=10k+6k+2\cdot 5k$

$x+y+2z=26k=520$

$k=20$

$k=20 \Rightarrow x=10\cdot 20=200$

Yanıt / The Answer is C

---

5. $\frac{a+b}{4}=\frac{a^2-b^2}{8}=\frac{16}{a-b}=k$

$(a+b)\cdot(a-b)=4\cdot 16$

$a^2-b^2=64$

$\frac{a^2-b^2}{8}=\frac{64}{8}=8=k$

$$\left.\begin{array}{l} a+b=32 \\ a-b=2 \end{array}\right\} \Rightarrow a=17$$

Yanıt / The Answer is C

6.
$$\left.\begin{array}{l} \frac{x}{y}=\frac{3}{5} \\ \frac{y}{z}=\frac{4}{3} \end{array}\right\} \Rightarrow \frac{x}{y}=\frac{12}{20}\ ,\ \frac{y}{z}=\frac{20}{15}$$

$x=12k,\ y=20k,\ z=15k$

$\Rightarrow \frac{2x+y}{x+2z}=\frac{24k+20k}{12k+30k}=\frac{44k}{42k}=\frac{22}{21}$

Yanıt / The Answer is C

7. $x+\frac{3}{y}=5 \Rightarrow xy+3=5y$

$y+\frac{3}{x}=2 \Rightarrow xy+3=2x$

$x+y+3=5y=2x \Rightarrow x=5k,\ y=2k$

$\frac{x+y}{2y-x}=\frac{5k+2k}{4k-5k}=-7$

Yanıt / The Answer is A

8. $\frac{a^2}{d^2}\cdot\frac{f}{e}\cdot\frac{c^2}{b^2}=\frac{a^2\cdot c^2\cdot f}{b^2\cdot d^2\cdot e}$

$=\frac{a^2}{b^2}\cdot\frac{c^2}{d^2}\cdot\frac{f}{e}$

$=\frac{9}{4}\cdot\frac{9}{4}\cdot\frac{2}{3}$

$=\frac{27}{8}$

Yanıt / The Answer is B

9. $\frac{x}{a}=\frac{y}{b}=\frac{z}{c}=\frac{5}{3} \Rightarrow \frac{3x+y+2z}{3a+b+2c}=\frac{5}{3}$

$$\left.\begin{aligned}3x+y+2z&=20\\ b+2c&=3\end{aligned}\right\} \Rightarrow \frac{20}{3a+3}=\frac{5}{3}$$

$60=15a+15$

$a=3$

$a=3 \Rightarrow x=5$

Yanıt / The Answer is E

10. $3x=5y=a\cdot z=12$

$\underset{(3)}{\frac{1}{x}}+\underset{(5)}{\frac{1}{y}}+\underset{(a)}{\frac{1}{z}}=\frac{3+5+a}{12}=1$

$3+5+a=12 \Rightarrow a=4$

Yanıt / The Answer is D

11. $\frac{x+y}{4}=\frac{y+z}{5}=\frac{x+z}{7}=k$

$\frac{x+y}{4}=\frac{y+z}{5}=\frac{-x-z}{-7}=k$

$\frac{2y}{2}=k$

$y=3 \Rightarrow k=3$

$\frac{x+y}{4}=k \Rightarrow x+y=4k$

$x+3=12$

$x=9$

Yanıt / The Answer is E

12. $x=2, y=3 \Rightarrow \frac{x+y}{y}\cdot(x-1)=\frac{5}{3}\cdot 1=\frac{5}{3}$

$k=\frac{5}{3}$

$x=3 \Rightarrow \frac{3+y}{y}\cdot(2)=\frac{5}{3}$

$\frac{6+2y}{y}=\frac{5}{3} \Rightarrow 18+6y=5y$

$y=-18$

Yanıt / The Answer is D

1. $\frac{3a-b}{2}=a+b \Rightarrow \frac{\mathbf{a+b}}{\mathbf{a-b}}=\mathbf{?}$

Yanıt / The Answer is: **2**

2. $\frac{a}{2}=\frac{b}{3}=\frac{c}{5}$,

$a+b+c=130 \Rightarrow \mathbf{c=?}$

Yanıt / The Answer is: **65**

3. $\frac{a}{4}=\frac{b}{5}=\frac{c}{7}=k$

$\frac{2a+b+xc}{34}=k \Rightarrow \mathbf{x=?}$

Yanıt / The Answer is: **3**

4. $\frac{a}{b}=\frac{3}{7} \quad \frac{b}{c}=\frac{2}{5} \Rightarrow \mathbf{a:b:c=?}$

Yanıt / The Answer is: **6 : 14 : 35**

5. $\frac{a}{5}=\frac{b}{4}=2c$,

$a+2b-c=100 \Rightarrow \mathbf{a=?}$

Yanıt / The Answer is: **40**

6. $\left.\begin{array}{l}\frac{a-2b}{b}=3\\ \frac{b+c}{c}=4\end{array}\right\} \Rightarrow \mathbf{a:b:c=?}$

Yanıt / The Answer is: **15 : 3 : 1**

7. $a, b, c \in \mathbb{R}^-$

$4a = 5b = 3c \Rightarrow \mathbf{max(a + b + c) = ?}$

Yanıt / The Answer is: **–47**

8. $\dfrac{x+y}{7} = \dfrac{x-y}{5} = \dfrac{xy}{12}$

$\Rightarrow \mathbf{x^2 + y^2 = ?}$

Yanıt / The Answer is: **148**

9. $2x = 5y = 4z$

$x + y + z = 76 \Rightarrow \mathbf{y = ?}$

Yanıt / The Answer is: **16**

10. $x, y, z \in \mathbb{R}^+$

$\dfrac{x}{5} = \dfrac{y}{3} = \dfrac{z}{7}$

$x^2 - 2y^2 + 3z^2 = 616 \Rightarrow \mathbf{z = ?}$

Yanıt / The Answer is: **14**

11. $\dfrac{x}{a} = \dfrac{y}{b} = \dfrac{z}{c} = \dfrac{5}{2}$

$3x + y + z = 15,$

$b + c = 2 \Rightarrow \mathbf{a = ?}$

Yanıt / The Answer is: $\mathbf{\dfrac{4}{3}}$

12. $x + \dfrac{2}{y} = 3, \ y + \dfrac{2}{x} = 4$

$x + 2y = 33 \Rightarrow \mathbf{x = ?}$

Yanıt / The Answer is: **9**

1. $\frac{a-b}{b}=\frac{2}{3} \Rightarrow \frac{\mathbf{a+b}}{\mathbf{b}}=\mathbf{?}$

A) $\frac{4}{3}$ B) $\frac{5}{3}$ C) 2 D) $\frac{7}{3}$ E) $\frac{8}{3}$

2. x, y, z ∈ N^+,

$\frac{x}{y}=\frac{4}{5}, \frac{y}{z}=\frac{3}{5} \Rightarrow$ **min(x + y + z) = ?**

A) 34 B) 42 C) 48 D) 51 E) 52

3. $\left.\begin{array}{l}2a=5b\\4b=c\end{array}\right\} \Rightarrow \frac{\mathbf{a}}{\mathbf{c}}=\mathbf{?}$

A) $\frac{2}{5}$ B) $\frac{3}{5}$ C) $\frac{3}{8}$ D) $\frac{5}{8}$ E) $\frac{7}{8}$

4. $x+\frac{1}{y}=\frac{4}{5}, \ y+\frac{1}{x}=\frac{5}{9} \Rightarrow \frac{\mathbf{y}}{\mathbf{x}}=\mathbf{?}$

A) $\frac{9}{20}$ B) $\frac{25}{18}$ C) $\frac{18}{25}$ D) $\frac{36}{25}$ E) $\frac{25}{36}$

5. $\frac{a}{b}=\frac{c}{d}=\frac{e}{f}=2 \Rightarrow \frac{\mathbf{a}}{\mathbf{b}}\cdot\frac{\mathbf{d}}{\mathbf{c}}\cdot\frac{\mathbf{e}}{\mathbf{f}}=\mathbf{?}$

A) 1 B) 2 C) 4 D) 8 E) 16

6. ax = by = cz = 20,

$\frac{1}{a}+\frac{1}{b}+\frac{1}{c}=\frac{1}{5} \Rightarrow \mathbf{x+y+z=?}$

A) 4 B) 10 C) 20 D) 40 E) 80

7. $\dfrac{xy}{3}=\dfrac{yz}{4}=\dfrac{xz}{5}$,

$x+y+z=141 \Rightarrow \mathbf{z=?}$

A) 36 B) 42 C) 49

D) 54 E) 60

---

8. $\left.\begin{aligned}&\dfrac{a}{5}=\dfrac{b}{7}=\dfrac{c}{9}\\&\dfrac{3x-6}{9}=\dfrac{a+b}{c}\end{aligned}\right\} \Rightarrow \mathbf{x=?}$

A) 6 B) 8 C) 12

D) 15 E) 18

---

9. $\dfrac{a}{b}=\dfrac{c}{d}$, $a{\cdot}d{\cdot}b-b^2{\cdot}c+2{\cdot}a-6=0 \Rightarrow \mathbf{a=?}$

A) 2 B) 3 C) 4

D) 8 E) 12

---

10. $\dfrac{a}{2}=\dfrac{b}{3}=4c$,

$a+b+c=105 \Rightarrow \mathbf{a=?}$

A) 10 B) 20 C) 30

D) 40 E) 50

---

11. $\dfrac{a}{x}=\dfrac{b}{y}=\dfrac{c}{z}=5$

$3a-2b+c=60$

$3x-2y=7 \Rightarrow \mathbf{z=?}$

A) 5 B) 6 C) 8

D) 10 E) 15

---

12. $\dfrac{a}{b+1}\cdot(2b-1)=k$

$a=4 \Rightarrow b=1$

$b=3 \Rightarrow \mathbf{a=?}$

A) $\dfrac{8}{5}$ B) $\dfrac{9}{5}$ C) 2

D) $\dfrac{11}{5}$ E) $\dfrac{12}{5}$

YANITLAR / ANSWERS

1. E	**2. E**	**3. D**	**4. E**	**5. B**	**6. A**	**7. E**	**8. A**
9. B	**10. D**	**11. A**	**12. A**				

1. $\frac{a}{2}=\frac{b}{3}=4c$

$a+b+c=420 \Rightarrow$ **a = ?**

A) 120 B) 130 C) 140 D) 150 E) 160

2. $x, y, z \in Z^-$

$\frac{x}{4}=\frac{y}{5}, \quad \frac{x}{z}=\frac{4}{3} \Rightarrow$ **? < ? < ?**

A) $x<y<z$ B) $y<x<z$ C) $z<y<x$ D) $x<z<y$ E) $y<z<x$

3. $\frac{x}{a}=\frac{y}{b}=\frac{z}{c}=15$

$3x-y+z=180$

$b-c=-6 \Rightarrow$ **a = ?**

A) 1 B) 2 C) 4 D) 5 E) 7

4. $\frac{x+y}{5}=\frac{x-z}{2}=\frac{x-y}{3}=k \Rightarrow$ **x : y : z = ?**

A) 3 : 2 : 4 B) 5 : 3 : 1 C) 2 : 1 : 6 D) 4 : 1 : 2 E) 3 : 1 : 4

5. $\frac{a}{b}=\frac{2}{3}, \quad \frac{b}{c}=\frac{4}{5}, \quad \frac{c}{d}=\frac{1}{2},$

$a+d=76 \Rightarrow$ **b = ?**

A) 24 B) 25 C) 27 D) 30 E) 32

6. $ax=by=cz=30$

$\frac{1}{x}+\frac{1}{y}-\frac{1}{z}=\frac{1}{2} \Rightarrow$ **a + b − c = ?**

A) 5 B) 6 C) 10 D) 15 E) 60

7. $x:y:z=\frac{1}{2}:\frac{1}{3}:\frac{1}{4}$,

$\frac{1}{x}+\frac{1}{y}+\frac{1}{z}=\frac{1}{4} \Rightarrow \mathbf{y=?}$

A) 4 B) 8 C) 12 D) 16 E) 20

8. $\frac{a-3}{4}=\frac{b+2}{2}=\frac{c-1}{5}$

$a-b+c=27 \Rightarrow \mathbf{c=?}$

A) 12 B) 14 C) 15 D) 16 E) 18

9. $$\left.\begin{array}{l} a+\frac{4}{b}=3 \\ b+\frac{4}{a}=5 \end{array}\right\} \Rightarrow \frac{\mathbf{a+b}}{\mathbf{b-a}}=\mathbf{?}$$

A) 1 B) 2 C) 3 D) 4 E) 5

10. $a=\frac{5b}{2}$,

$c=4b$,

$a+c=26 \Rightarrow \mathbf{b=?}$

A) 4 B) 6 C) 8 D) 10 E) 12

11. $\frac{xy}{3}=\frac{yz}{2}=\frac{xz}{5} \Rightarrow \mathbf{x:y:z=?}$

A) 15 : 6 : 10 B) 9 : 7 : 12 C) 4 : 6 : 9 D) 12 : 5 : 18 E) 12 : 8 : 25

12. $\frac{x-2}{3}=\frac{y+1}{4}=\frac{z-3}{5}$

$x-y+z=46 \Rightarrow \mathbf{y=?}$

A) 39 B) 42 C) 45 D) 49 E) 52

YANITLAR / ANSWERS

1. E 2. B 3. B 4. D 5. A 6. D 7. C 8. D
9. D 10. A 11. A 12. A

1. $\left.\begin{array}{l} 3a+\dfrac{6}{b}=4 \\ b+\dfrac{2}{a}=5 \end{array}\right\} \Rightarrow \dfrac{a+b}{4a-b}=?$

A) 18 B) 19 C) 20 D) 21 E) 22

2. $\dfrac{a}{b}=\dfrac{c}{d}=\dfrac{e}{f}=\dfrac{1}{2} \Rightarrow \dfrac{a\cdot d^2\cdot e}{b\cdot c^2\cdot f}=?$

A) 1 B) $\frac{1}{2}$ C) $\frac{1}{4}$ D) $\frac{1}{8}$ E) $\frac{1}{16}$

3. $\dfrac{x+y}{5}=\dfrac{y+z}{8}=\dfrac{x+z}{7}$

$x-y=-6 \Rightarrow z=?$

A) 24 B) 25 C) 27 D) 30 E) 32

4. $\left.\begin{array}{l} \dfrac{3a}{a+b}=\dfrac{1}{2} \\ \dfrac{b}{b+c}=\dfrac{2}{3} \end{array}\right\} \Rightarrow a:b:c=?$

A) 4 : 7 : 2 B) 3 : 8 : 6 C) 2 : 10 : 5 D) 5 : 3 : 1 E) 4 : 1 : 5

5. $\dfrac{1}{3x}=\dfrac{2}{5y}=\dfrac{3}{4z}$,

$x+y+z=89 \Rightarrow y-x=?$

A) 1 B) 2 C) 3 D) 4 E) 5

6. $\dfrac{x}{2}=\dfrac{y}{3}=\dfrac{x+y+z}{7}$,

$2x-y+z=9 \Rightarrow y=?$

A) 2 B) 4 C) 6 D) 8 E) 9

7. $\frac{a-b+c}{3}=\frac{a+b-c}{5}=\frac{b+c-a}{9}$,

$a+b+c=51 \Rightarrow \mathbf{a=?}$

A) 6 B) 9 C) 12

D) 15 E) 18

8. $a, b, c \in R^+$

$\frac{3}{4ab}=\frac{2}{5bc}=\frac{4}{3ac} \Rightarrow \mathbf{?<?<?}$

A) $c<a<b$ B) $a<b<c$ C) $b<c<a$

D) $c<b<a$ E) $b<a<c$

9. $\frac{x-2}{3}=\frac{y+1}{4}=\frac{z+1}{6}$,

$x+y+z=182 \Rightarrow \mathbf{z=?}$

A) 83 B) 84 C) 86

D) 88 E) 90

10. $\frac{x+y}{8}=\frac{x+y-z}{5}=\frac{x+z}{4}$,

$z-x=12 \Rightarrow \mathbf{y=?}$

A) 30 B) 32 C) 36

D) 40 E) 42

11. $a, b, c \in R^+$

$\frac{a}{2}=\frac{b}{3}=\frac{c}{5}$,

$a^2+b^2-c^2=-48 \Rightarrow \mathbf{b+c=?}$

A) 10 B) 12 C) 14

D) 16 E) 18

12. $\frac{a}{b}=\frac{b}{c}=\frac{c}{d}=3 \Rightarrow \mathbf{\frac{a}{d}=?}$

A) 1 B) 3 C) 9

D) 27 E) 81

YANITLAR / ANSWERS

1. B	**2. A**	**3. D**	**4. C**	**5. D**	**6. E**	**7. C**	**8. C**
9. A	**10. E**	**11. D**	**12. D**				

1. $\left.\begin{array}{l}\dfrac{x}{4}=\dfrac{y}{5}\\[2mm]\dfrac{y}{3}=\dfrac{z}{2}\end{array}\right\}$, $4x-3y+2z=23 \Rightarrow \mathbf{z=?}$

A) 4 B) 6 C) 7 D) 8 E) 10

2. $\left.\begin{array}{l}ax=by=cz=6\\x+y+z=24\end{array}\right\} \Rightarrow \dfrac{\mathbf{7}}{\mathbf{2a}}+\dfrac{\mathbf{7}}{\mathbf{2b}}+\dfrac{\mathbf{7}}{\mathbf{2c}}=\mathbf{?}$

A) 7 B) 14 C) 21 D) 28 E) 35

3. $a, b, c \in R^+$,

$\dfrac{a}{4}=\dfrac{b}{3}=\dfrac{c}{6}$,

$\sqrt{a^2+b^2}=60 \Rightarrow \mathbf{c=?}$

A) 48 B) 60 C) 72 D) 84 E) 96

4. $\left.\begin{array}{l}\dfrac{a+b}{a-b}=\dfrac{x}{y}\\[2mm]\dfrac{3}{x}=\dfrac{4}{y}\end{array}\right\} \Rightarrow \dfrac{\mathbf{a+2b}}{\mathbf{b}}=\mathbf{?}$

A) –1 B) –2 C) –3 D) –4 E) –5

5. $\dfrac{a}{x}=\dfrac{b}{y}=\dfrac{c}{z}=5$,

$3a-b+2c=30$,

$3x-y=4 \Rightarrow \mathbf{z=?}$

A) 1 B) 4 C) 6 D) 8 E) 10

6. $\dfrac{3a+1}{x}=\dfrac{b-3}{y}=\dfrac{2c+1}{z}=2$

$6a+b+2c=40 \Rightarrow \mathbf{2x+y+z=?}$

A) 15 B) 20 C) 25 D) 30 E) 35

7. $\dfrac{x}{(y+2)}\cdot(x^2-1)=k$

$x=3 \Rightarrow y=6$

$x=4 \Rightarrow$ **$y=?$**

A) 12 B) 14 C) 16 D) 18 E) 20

8. $\dfrac{x}{a}=\dfrac{y}{b}=\dfrac{z}{c}=3$,

$2x+3y-z=48$,

$2a-c=10 \Rightarrow$ **$b=?$**

A) 2 B) 4 C) 6 D) 8 E) 10

9. $\dfrac{a+2}{b}=\dfrac{b+3}{c}=\dfrac{c+4}{a}=2 \Rightarrow$ **$a+b+c=?$**

A) 9 B) 11 C) 12 D) 14 E) 15

10. $\dfrac{a}{xy}=\dfrac{b}{xz}=\dfrac{c}{yz}$,

$a+b+c=\dfrac{2}{x}+\dfrac{2}{y}+\dfrac{2}{z} \Rightarrow$ **$a\cdot z=?$**

A) 2 B) 3 C) 4 D) 5 E) 6

11. $\dfrac{a}{b}=\dfrac{c}{d}=k$

$\dfrac{3a+16}{9b+12d}=\dfrac{k}{3} \Rightarrow$ **$c=?$**

A) 2 B) 4 C) 5 D) 6 E) 8

12. $ax=by=cz=36$

$xy+yz+xz=xyz$

$\Rightarrow$ **$a+b+c=?$**

A) 24 B) 28 C) 30 D) 32 E) 36

YANITLAR / ANSWERS

1. E	**2. B**	**3. C**	**4. E**	**5. A**	**6. B**	**7. D**	**8. A**
9. A	**10. A**	**11. B**	**12. E**				

ÜNİTE 3

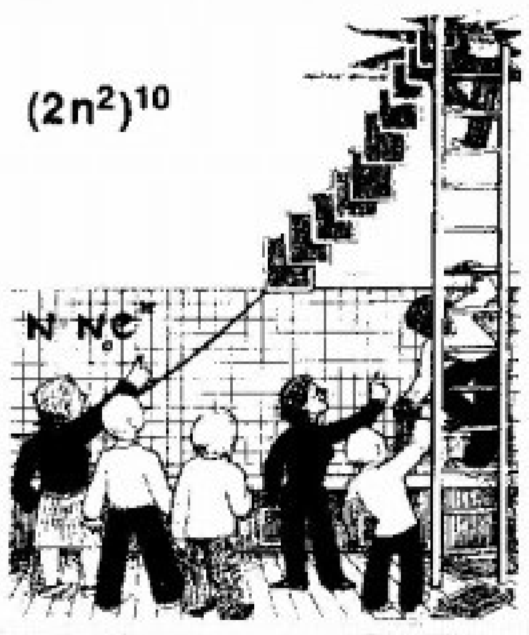
UNIT

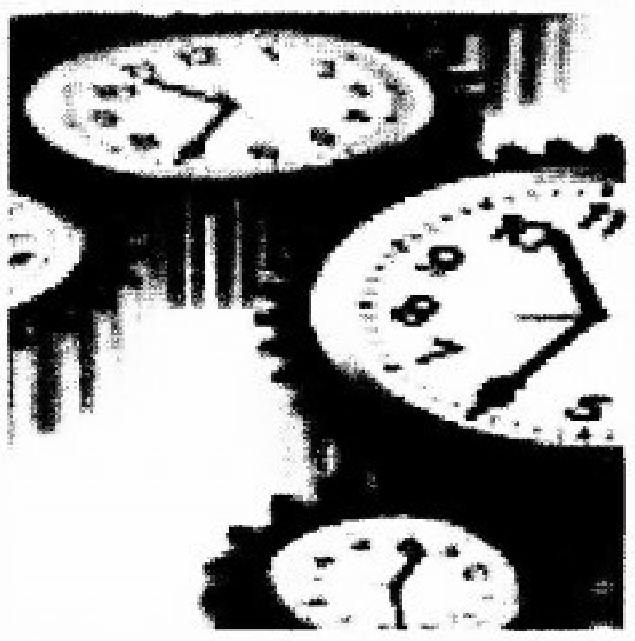
Bu ünitede; üslü sayılar, köklü sayılar ve onların özellikleri ayrıntılı anlatılmıştır.

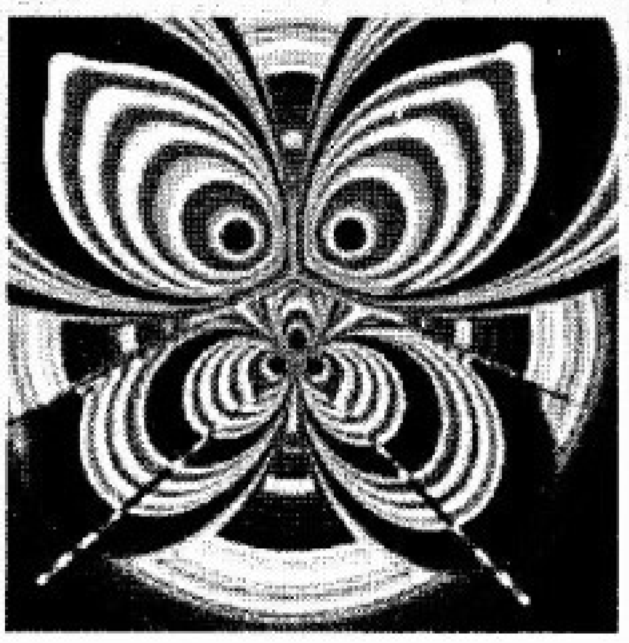
Bu ünite, 68 çözümlü örnek, 24 alıştırma, 96 test sorusu içermektedir.

In this unit, exponentials, radicals and their properties are explained in detailed.

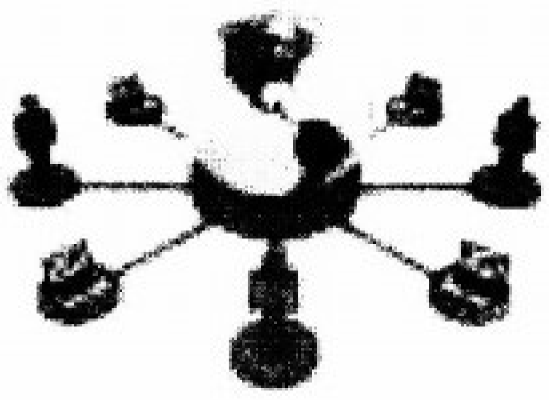
This unit includes; 96 test questions.







- **ÜSLÜ SAYILAR / *EXPONENTIALS*** . . . . 123 – 144
- **KÖKLÜ SAYILAR / *RADICALS*** . . . . 145 – 176



1. $\dfrac{3^x+3^x+3^x+3^x}{12^x+12^x}=\dfrac{1}{32} \Rightarrow x=?$

A) –3
B) –2
C) 1
D) 2
E) 3

2. $\dfrac{2^{n+1}+2^{n-1}}{2^n}-\dfrac{3^{n+2}-3^n}{3^{n+1}}=?$

A) $-\dfrac{1}{2}$
B) $-\dfrac{1}{3}$
C) $-\dfrac{1}{4}$
D) $-\dfrac{1}{5}$
E) $-\dfrac{1}{6}$

3. $\left.\begin{array}{l} a=3^x-1 \\ b=2^x-1 \end{array}\right\} \Rightarrow ab+a+b+1=?$

A) 6^x-2
B) 6^x-1
C) 6^x
D) 6^x+1
E) 6^x+2

4. $3^{a+2}+\dfrac{6}{3^{1-a}}=99 \Rightarrow a=?$

A) 2
B) 1
C) –1
D) –2
E) –3

5. $\dfrac{2^{2x+3}+24}{2^{2x+3}}=\dfrac{2^{x-2}}{16}+\dfrac{3}{4^x} \Rightarrow x=?$

A) 3
B) 4
C) 5
D) 6
E) 7

6. $\left.\begin{array}{l} 5^x=27 \\ 3^y=125 \end{array}\right\} \Rightarrow x \cdot y=?$

A) 9
B) 15
C) 18
D) 21
E) 27

7. $\dfrac{2^{-8}-2^{-12}+2^{-9}}{2^{-11}+2^{-10}-2^{-14}}=?$

A) $\dfrac{1}{4}$

B) $\dfrac{2}{3}$

C) 2

D) 4

E) 8

8. $\dfrac{4}{5^{x-2}+1}+\dfrac{4}{5^{2-x}+1}=?$

A) 2

B) 4

C) 5

D) 10

E) 20

9. $a^3 \cdot b^2 = 1$

$a^{x+1} = b^{2x-1} \Rightarrow 8x = ?$

A) –2

B) –1

C) 1

D) 2

E) 3

10. $\left.\begin{array}{l} 2^a = 10 \\ 2^b = 5 \end{array}\right\} \Rightarrow 2^{a^2-b^2} = ?$

A) 50

B) 60

C) 80

D) 100

E) 120

11. $\left.\begin{array}{l} 2^x = 3 \\ 3^y = 2 \\ 5^z = 80 \end{array}\right\} \Rightarrow ? < ? < ?$

A) $z < x < y$

B) $x < z < y$

C) $y < x < z$

D) $y < z < x$

E) $x < y < z$

12. $\left.\begin{array}{l} 2^x = 9 \\ 5 \cdot 3^y = 80 \end{array}\right\} \Rightarrow x \cdot y = ?$

A) 8

B) 9

C) 10

D) 12

E) 16

YANITLAR / ANSWERS

1. E 2. E 3. C 4. A 5. D 6. A 7. D 8. B

9. C 10. A 11. C 12. A

1. $$\frac{3^x+3^x+3^x+3^x}{12^x+12^x}=\frac{1}{32}$$

$$\frac{4\cdot 3^x}{2\cdot 4^x\cdot 3^x}=\frac{1}{32}$$

$$4^x=64$$

$$x=3$$

Yanıt / The Answer is E

2. $$\frac{2^{n+1}+2^{n-1}}{2^n}-\frac{3^{n+2}-3^n}{3^{n+1}}=\frac{2{\cdot}2^n+\frac{1}{2}\cdot 2^n}{2^n}-\frac{3^n\cdot 9-3^n}{3\cdot 3^n}$$

$$=\left(2+\frac{1}{2}\right)-\frac{8}{3}$$

$$=\frac{5}{2}-\frac{8}{3}$$

$$=\frac{15-16}{6}$$

$$=-\frac{1}{6}$$

Yanıt / The Answer is E

3. $a{\cdot}b + a + b + 1 = a(b + 1) + b + 1$

$= (a + 1)(b + 1)$

$= 3^x \cdot 2^x$

$= 6^x$

Yanıt / The Answer is C

4. $$3^{a+2}+\frac{6}{3^{1-a}}=99$$

$$9\cdot 3^a+\frac{6}{3\cdot\frac{1}{3^a}}=99$$

$$9\cdot 3^a+\frac{6\cdot 3^a}{3}=99$$

$$33\cdot 3^a=3\cdot 99$$

$$a=2$$

Yanıt / The Answer is A

5. $$\frac{2^{2x+3}+24}{2^{2x+3}}=\frac{2^{x-2}}{16}+\frac{3}{4^x}$$

$$\frac{2^{2x}\cdot 8+24}{2^{2x}\cdot 8}=\frac{2^x}{64}+\frac{3}{4^x}$$

$$\frac{8(4^x+3)}{8\cdot 4^x}-\frac{3}{4^x}=\frac{2^x}{64}$$

$$\frac{4^x+3-3}{4^x}=\frac{2^x}{64}$$

$$2^x=64$$

$$x=6$$

Yanıt / The Answer is D

6. $$\left.\begin{aligned}5^x&=3^3\\5^3&=3^y\end{aligned}\right\}\Rightarrow\frac{x}{3}=\frac{3}{y}$$

$$\Rightarrow\ x\cdot y=3\cdot 3=9$$

Yanıt / The Answer is A

7. $$\frac{2^{-8}-2^{-12}+2^{-9}}{2^{-11}+2^{-10}-2^{-14}}=\frac{2^{-12}(2^4-1+2^3)}{2^{-14}(2^3+2^4-1)}$$

$$=2^2$$

$$=4$$

Yanıt / The Answer is D

8. $$\frac{4}{5^{x-2}+1}+\frac{4}{5^{2-x}+1}=\frac{4}{5^x\cdot5^{-2}+1}+\frac{4}{5^2\cdot5^{-x}+1}$$

$$=\frac{4}{\frac{5^x+25}{25}}+\frac{4}{\frac{25+5^x}{5^x}}$$

$$=\frac{4\cdot25+4\cdot5^x}{25+5^x}$$

$$=4$$

Yanıt / The Answer is B

9. $$\left.\begin{array}{l}a^3=b^{-2}\\ a^{x+1}=b^{2x-1}\end{array}\right\}\Rightarrow\frac{3}{x+1}=\frac{-2}{2x-1}$$

$$3(2x-1)=-2(x+1)$$

$$6x-3=-2x-2$$

$$8x=1$$

Yanıt / The Answer is C

10. $$\left.\begin{array}{l}2^a=10\\ 2^b=5\end{array}\right\}\Rightarrow 2^{a^2-b^2}=(2^{a-b})^{a+b}$$

$$=2^{a+b}=10\cdot5=50$$

Yanıt / The Answer is A

11. $2<3<4 \Rightarrow 2^1<2^x<2^2$

$1<2<3 \Rightarrow 3^0<3^y<3^1$

$25<80<125 \Rightarrow 5^2<5^z<5^3$

$$\left.\begin{array}{l}1<x<2\\ 0<y<1\\ 2<z<3\end{array}\right\}\Rightarrow y<x<z$$

Yanıt / The Answer is C

12. $5\cdot3^y=80 \Rightarrow 3^y=16$

$$\left.\begin{array}{l}3^y=16\\ 2^x=9\end{array}\right\}\Rightarrow\frac{y}{2}=\frac{4}{x}\Rightarrow x\cdot y=8$$

Yanıt / The Answer is A

1. $[(-2^{-2})^{-3}]^{-1} : (-2^{2})^{-3} = ?$

Yanıt / The Answer is: **1**

2. $\left.\begin{array}{l} 3^{x} = a \\ 2^{x} = b \end{array}\right\} \Rightarrow \mathbf{24^{x} = ?}$

Yanıt / The Answer is: **ab^3**

3. $\left[\left(\frac{1}{81}\right)^{-3}\right]^{0,25} = ?$

Yanıt / The Answer is: **27**

4. $3^{x+2} + 3^{x-2} + 3^{x} = \frac{182}{9} \Rightarrow \mathbf{3^{x+1} = ?}$

Yanıt / The Answer is: **6**

5. $2^{x-y} = 6^{-y} \Rightarrow \mathbf{3^{\frac{y}{x}} = ?}$

Yanıt / The Answer is: $\mathbf{\frac{1}{2}}$

6. $A = \underbrace{2 \cdot 2 \cdot 2 \ldots 2}_{x \text{ tane / times}}$

$B = \underbrace{2 + 2 + 2 + \ldots + 2}_{2^{x} \text{ tane / times}}$

$A + B = 96 \Rightarrow \mathbf{x = ?}$

Yanıt / The Answer is: **5**

7. $(x-3)^6 = 64x^6 \Rightarrow \sum x = ?$

Yanıt / The Answer is: **−2**

8. $\dfrac{3^x+9^x+27^x}{2^x+6^x+18^x} = \dfrac{8}{27} \Rightarrow x = ?$

Yanıt / The Answer is: **−3**

9. $2^{x-1} = 5 \Rightarrow 2^{x+1} + 2^{2-x} = ?$

Yanıt / The Answer is: $\frac{102}{5}$

10. $9^x = 3^{x-1} \Rightarrow 2^{-x+3} = ?$

Yanıt / The Answer is: **16**

11. $\left.\begin{array}{l} 3^x = 5 \\ 5^y = 8 \\ 2^z = 9 \end{array}\right\} \Rightarrow x \cdot y \cdot z = ?$

Yanıt / The Answer is: **6**

12. $(x+2)^{x^2-x-6} = 1 \Rightarrow \sum x = ?$

Yanıt / The Answer is: **−1**

1. $\dfrac{a^{-2}\cdot(-a)^3\cdot(-a^4)}{-a^{-4}\cdot(-a)^3}=?$

A) $-a^6$ B) $-a^4$ C) a^2

D) a^4 E) a^6

2. $\dfrac{2^{-10}+2^{-14}-2^{-12}}{2^{-5}-2^{-7}+2^{-9}}=?$

A) $\dfrac{1}{32}$ B) $\dfrac{1}{8}$ C) 2

D) 8 E) 32

3. $\dfrac{4^{x+2}-4^{x-1}}{2\cdot 4^{x+1}-4^{x}}=?$

A) $\dfrac{3}{4}$ B) $\dfrac{5}{4}$ C) $\dfrac{7}{4}$

D) $\dfrac{9}{4}$ E) $\dfrac{11}{4}$

4. $81^{x+2}=27^{2x-3}\Rightarrow x=?$

A) $\dfrac{17}{2}$ B) $\dfrac{19}{2}$ C) $\dfrac{21}{2}$

D) $\dfrac{23}{2}$ E) $\dfrac{25}{2}$

5. $(3x-2)^4=(x+5)^4 \Rightarrow \sum x=?$

A) $\dfrac{7}{2}$ B) $\dfrac{7}{4}$ C) $\dfrac{11}{4}$

D) $\dfrac{15}{4}$ E) $\dfrac{19}{4}$

6. $2^{x+y-7}=3^{x-y+1}\Rightarrow x\cdot y=?$

A) 12 B) 14 C) 16

D) 18 E) 20

7. $5^x = 3 \Rightarrow 9^{\frac{x+1}{x}} = ?$

A) 125 B) 150 C) 175 D) 200 E) 225

8. $3^{x+1} = 15^x \Rightarrow 25^x = ?$

A) 3 B) 9 C) 12 D) 18 E) 25

9. $\left.\begin{array}{l} 2^{x+1} = 5 \\ 4^y = 20 \end{array}\right\} \Rightarrow x = ?$

A) 2y + 1 B) 2y – 3 C) y + 5 D) y – 4 E) 5 – y

10. $\left.\begin{array}{l} 2^x = 3^{x+1} \\ 2^{y+1} = 3^y \end{array}\right\} \Rightarrow x + y = ?$

A) –3 B) –2 C) –1 D) 0 E) 1

11. $(x + 1)^{x-3} = 1 \Rightarrow \sum x = ?$

A) 0 B) 1 C) 2 D) 3 E) 4

12. $x = (-5^3)^4$, $y = (-5)^{(3^4)}$, $z = (-25^2)^3$

$\Rightarrow ? < ? < ?$

A) x < z < y B) x < y < z C) y < x < z D) y < z < x E) z < x < y

YANITLAR / ANSWERS

1. E 2. A 3. D 4. A 5. C 6. A 7. E 8. B
9. B 10. C 11. D 12. D

1. $\left(\frac{5}{4}\right)^{3-x}=\frac{4}{5}$, $8^{3y}=x \Rightarrow 2^{9y+1}=?$

A) 2 B) 4 C) 8
D) 16 E) 32

2. $\left.\begin{matrix} x^{a+b}=150 \\ x^{a-b}=6 \end{matrix}\right\} \Rightarrow \frac{x^{a}+x^{b}}{x^{a}-x^{b}}=?$

A) $\frac{1}{5}$ B) $\frac{3}{5}$ C) $\frac{7}{5}$
D) $\frac{9}{5}$ E) $\frac{11}{5}$

3. $5^{2n-1}=2 \Rightarrow 25^{3n-2}=?$

A) $\frac{4}{5}$ B) $\frac{6}{5}$ C) $\frac{8}{5}$
D) $\frac{16}{5}$ E) $\frac{32}{5}$

4. $\frac{(-3^{-4})^{-3}\cdot(-9^{-2})^{-3}}{(-9)^{-1}\cdot(-81^{-4})^{-1}}=?$

A) 3^{10} B) 3^{5} C) 3^{-5}
D) 3^{-10} E) 3^{-15}

5. $3^{x+y}=6^{x} \Rightarrow 4^{\frac{x}{y}}=?$

A) 3 B) 9 C) 27
D) 81 E) 243

6. $2\cdot3^{x+1}-4\cdot3^{x-1}+5\cdot3^{x}=87 \Rightarrow x=?$

A) 1 B) 2 C) 3
D) 4 E) 5

7. $\left.\begin{array}{l} 2^x \cdot 3^y = 4 \\ 2^y \cdot 3^x = 9 \end{array}\right\} \Rightarrow \mathbf{x + y = ?}$

A) 1　　B) 2　　C) 3　　D) 4　　E) 5

8. $15^x = 9^y \cdot 5^x \quad \Rightarrow \quad \mathbf{\dfrac{x+y}{x-y} = ?}$

A) –1　　B) 1　　C) 2　　D) 3　　E) 4

9. $\left.\begin{array}{l} x = 2^{100} \\ y = 3^{125} \\ z = 4^{75} \end{array}\right\} \Rightarrow \mathbf{? < ? < ?}$

A) $z < x < y$　　B) $y < z < x$　　C) $y < x < z$　　D) $x < y < z$　　E) $x < z < y$

10. $75^{x+1} = 3^{x-1} \cdot 5^{2x+1} \cdot A \Rightarrow \mathbf{A = ?}$

A) 9　　B) 15　　C) 30　　D) 45　　E) 75

11. $3^{2x-y+4} = 5^{x+y-1} \quad \Rightarrow \mathbf{x \cdot y = ?}$

A) –6　　B) –5　　C) –4　　D) –3　　E) –2

12. $2^1 \cdot 2^2 \cdot 2^3 \cdot \ldots \cdot 2^n = (0{,}5)^{-45} \quad \Rightarrow \mathbf{n = ?}$

A) 5　　B) 6　　C) 7　　D) 8　　E) 9

YANITLAR / ANSWERS

1. C　2. C　3. C　4. A　5. B　6. B　7. B　8. D

9. E　10. D　11. E　12. E

1. $[(-0{,}5)^{-3} + (3^{-2})^{-1} + (-7)^{0}]^{-1} = ?$

A) -1 B) $-\frac{1}{2}$ C) $\frac{1}{2}$

D) 1 E) $\frac{3}{2}$

---

2. $\left.\begin{array}{l} 2^{a+1} = b \\ 2^{a-2} = x \cdot b \end{array}\right\} \Rightarrow x = ?$

A) $\frac{1}{8}$ B) $\frac{1}{4}$ C) 2

D) 4 E) 8

---

3. $48^{x+2} = 4^{2x+5} \Rightarrow 3^{x} = ?$

A) $\frac{1}{9}$ B) $\frac{4}{9}$ C) $\frac{5}{9}$

D) $\frac{16}{9}$ E) $\frac{32}{9}$

---

4. $\left.\begin{array}{l} x = \underbrace{5^{3} \cdot 5^{3} \cdot 5^{3} \cdot \ldots \cdot 5^{3}}_{\text{n tane (n times)}} \\ y = \underbrace{5^{n} + 5^{n} + \ldots + 5^{n}}_{5^{n} \text{ tane } (5^{n} \text{ times})} \end{array}\right\} \Rightarrow \frac{x}{y} = ?$

A) 5^{-n} B) 1 C) 5^{n}

D) $5 \cdot 2^{n}$ E) $5 \cdot 3^{n}$

---

5. $2^{x} = 3 \Rightarrow 4^{x+1} - 8^{x} = ?$

A) 3 B) 6 C) 9

D) 12 E) 15

---

6. $2^{x+3} - 3 \cdot 2^{x-1} + 2^{x} = 60 \Rightarrow x = ?$

A) 1 B) 2 C) 3

D) 4 E) 5

7. $\left.\begin{array}{l} 2^x = 125 \\ 5^y = 16 \end{array}\right\} \Rightarrow x \cdot y = ?$

A) 6 B) 8 C) 9 D) 10 E) 12

8. $\left.\begin{array}{l} a = \left((-2)^{-2}\right)^{-1} \\ b = \left((-2)^{3}\right)^{1} \\ c = \left(2^{-2}\right)^{2} \end{array}\right\} \Rightarrow ? < ? < ?$

A) a < b < c B) b < c < a C) c < b < a D) a < c < b E) c < a < b

9. $\left.\begin{array}{l} a = 2^{45} \\ b = 3^{27} \\ c = 5^{18} \end{array}\right\} \Rightarrow ? < ? < ?$

A) a < b < c B) b < a < c C) a < c < b D) c < b < a E) c < a < b

10. $\left.\begin{array}{l} a^{x-1} = 5 \\ a^x - 2 = a \end{array}\right\} \Rightarrow a = ?$

A) $-\frac{3}{2}$ B) −1 C) $-\frac{1}{2}$ D) $\frac{1}{2}$ E) 1

11. $\dfrac{(-3)^x \cdot (-3^x)^4 \cdot (-3)^{-x}}{-3^x \cdot 3^{3x}} = ?$

A) -3^x B) −1 C) 1 D) 3^x E) 3^{2x}

12. $\dfrac{2^x \cdot 2^x \cdot 2^x}{2^x + 2^x + 2^x + 2^x} = \dfrac{1}{16} \Rightarrow x = ?$

A) −2 B) −1 C) 1 D) 2 E) 3

YANITLAR / ANSWERS

1. C	2. A	3. B	4. C	5. C	6. C	7. E	8. B
9. D	10. D	11. B	12. B				

1. $\left.\begin{array}{l} 2^a = 5 \\ 25^b = 27 \end{array}\right\} \Rightarrow 2^{4ab} = ?$

A) 3^2 B) 3^4 C) 3^6 D) 3^8 E) 3^{10}

2. $\dfrac{3^{n+2}+3^{n+1}}{5^{n+1}-5^{n}} = \dfrac{25}{3} \Rightarrow n = ?$

A) –2 B) –1 C) 1 D) 2 E) 3

3. x, y ∈ Z,

$\left(\dfrac{1}{x^3}\right)^{2y} = 64 \Rightarrow x+y = ?$

A) –2 B) –1 C) 1 D) 2 E) 3

4. $\left.\begin{array}{l} (0{,}2)^x = 27 \\ (0{,}04)^y = 9 \end{array}\right\} \Rightarrow \dfrac{x+3y}{x-2y} = ?$

A) 2 B) 3 C) 4 D) 5 E) 6

5. x ∈ Z,

$\left(\dfrac{1}{2}\right)^{x+2} < \left(\dfrac{1}{4}\right)^{x-2} \Rightarrow \max(x) = ?$

A) 2 B) 3 C) 4 D) 5 E) 6

6. x ∈ Z,

$\left(\dfrac{2}{5}\right)^{x+1} > \left(\dfrac{25}{4}\right)^{x-1} \Rightarrow \max(x) = ?$

A) 1 B) 0 C) –1 D) –2 E) –3

7. $\dfrac{4}{5^{x}+1}+\dfrac{4}{5^{-x}+1}=?$

A) 1 B) 2 C) 3 D) 4 E) 5

8. $48^{x}=12 \Rightarrow 2^{4x-1}\cdot 3^{x+1}=?$

A) 6 B) 8 C) 12 D) 15 E) 18

9. $\left.\begin{aligned} 2^{x}&=7\\ 3^{y}&=2\\ 5^{z}&=10 \end{aligned}\right\} \Rightarrow ?<?<?$

A) $x<y<z$ B) $y<z<x$ C) $z<x<y$ D) $y<x<z$ E) $x<z<y$

10. $\left.\begin{aligned} x&=2+3^{2-2a}\\ y&=9^{a+1}-5 \end{aligned}\right\} \Rightarrow (x-2)(y+5)=?$

A) 27 B) 36 C) 48 D) 75 E) 81

11. $\left.\begin{aligned} 3^{x}\cdot 5^{y}&=375\\ 3^{y}\cdot 5^{x}&=135 \end{aligned}\right\} \Rightarrow x+y=?$

A) 4 B) 5 C) 6 D) 7 E) 8

12. $a^{x}>0,$

$\left.\begin{aligned} a^{x+y}&=45\\ a^{x-y}&=5 \end{aligned}\right\} \Rightarrow a^{x}=?$

A) 3 B) 5 C) 9 D) 15 E) 27

YANITLAR / ANSWERS							
1. C	2. A	3. C	4. E	5. D	6. B	7. D	8. E
9. B	10. E	11. A	12. D				

1. $A \in R,\ x \in Z,$

$\sqrt{x+5} + \sqrt[3]{x-1} + \sqrt[4]{2-x} = A \Rightarrow \sum x = ?$

A) 4 B) 1 C) –5 D) –9 E) –12

2. $A \in R$

$\dfrac{\sqrt{x-2}+3x}{2x-\sqrt{2-x}} = A \Rightarrow A = ?$

A) $\frac{1}{2}$ B) 1 C) $\frac{3}{2}$ D) 2 E) $\frac{5}{2}$

3. $\sqrt[6]{(-3)^6} - \sqrt{(-5)^2} = ?$

A) –8 B) –3 C) –2 D) 2 E) 8

4. $\sqrt{1-\dfrac{25}{169}} \cdot \sqrt{1+\dfrac{9}{16}} = ?$

A) $\frac{4}{13}$ B) $\frac{9}{13}$ C) $\frac{12}{13}$ D) $\frac{14}{13}$ E) $\frac{15}{13}$

5. $\sqrt{1,44} - \sqrt[3]{0,027} + \sqrt[4]{0,0016} = ?$

A) 0,11 B) 1,1 C) 1,4 D) 2,1 E) 3,2

6. $\sqrt[3]{-60-\sqrt{19-\sqrt[3]{8-(-19)}}} = ?$

A) –4 B) –2 C) 3 D) 4 E) 5

7. $\left.\begin{array}{l} a=\sqrt{3} \\ b=\sqrt[3]{9} \\ c=\sqrt[4]{2} \end{array}\right\} \Rightarrow \ ?<?<?$

A) $a<c<b$ B) $b<c<a$ C) $c<a<b$
D) $c<b<a$ E) $a=b<c$

8. $A \in N$

$\sqrt{2000}\cdot x=A \Rightarrow$ **min(x) = ?**

A) $\sqrt{2}$ B) $\sqrt{3}$ C) $\sqrt{5}$
D) $\sqrt{7}$ E) $\sqrt{11}$

9. $\sqrt[4]{2\sqrt{\frac{1}{2}\sqrt[3]{4}}}=?$

A) $\sqrt[3]{4}$ B) $\sqrt[6]{32}$ C) $\sqrt[15]{16}$
D) $\sqrt[18]{32}$ E) $\sqrt[24]{32}$

10. $\dfrac{\sqrt[3]{4}\cdot\sqrt[15]{2}}{\sqrt[5]{8}}=\sqrt[15]{2^x} \Rightarrow x=?$

A) 2 B) 4 C) 6
D) 8 E) 16

11. $\dfrac{1}{\sqrt{3}}+\dfrac{4}{\sqrt{27}}-\dfrac{4}{\sqrt{12}}=?$

A) $3\sqrt{3}$ B) $2\sqrt{3}$ C) $\dfrac{\sqrt{3}}{3}$
D) $\dfrac{\sqrt{3}}{9}$ E) $\dfrac{\sqrt{3}}{27}$

12. $\dfrac{\sqrt{5}}{\sqrt{10}+\sqrt{5}}+1=?$

A) $\sqrt{2}$ B) $\sqrt{3}$ C) $\sqrt{5}$
D) $\sqrt{10}$ E) $\sqrt{15}$

YANITLAR / ANSWERS							
1. E	2. C	3. C	4. E	5. B	6. A	7. C	8. C
9. E	10. A	11. D	12. A				

1. $\sqrt{x+5}+\sqrt[3]{x-1}+\sqrt[4]{2-x}=A \quad , \quad A\in R$

$x+5\geq 0 \qquad 2-x\geq 0$

$x\geq -5 \qquad 2\geq x$

$\Rightarrow -5\leq x\leq 2 \quad (x\in Z)$

$\Rightarrow \sum x=-5+-4+...+1+2=-12$

Yanıt / The Answer is E

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2. $\dfrac{\sqrt{x-2}+3x}{2x-\sqrt{2-x}}=A \quad , \quad A\in R$

$\sqrt{x-2}\in R \Rightarrow x-2\geq 0 \; , \quad x\geq 2 ......$ **(1)**

$\sqrt{2-x}\in R \Rightarrow 2-x\geq 0 \; , \quad x\leq 2 ......$ **(2)**

1 ve (and) 2

$x=2 \Rightarrow \dfrac{\sqrt{2-2}+3\cdot 2}{2\cdot 2-\sqrt{2-2}}=\dfrac{6}{4}=\dfrac{3}{2}=A$

Yanıt / The Answer is C

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3. $\sqrt[6]{(-3)^6}-\sqrt{(-5)^2}=|-3|-|-5|$

$=3-5$

$=-2$

Yanıt / The Answer is C

---

4. $\sqrt{1-\dfrac{25}{169}}\cdot\sqrt{1+\dfrac{9}{16}}=\sqrt{\dfrac{169-25}{169}}\cdot\sqrt{\dfrac{16+9}{16}}$

$=\sqrt{\dfrac{144}{169}}\cdot\sqrt{\dfrac{25}{16}}$

$=\dfrac{12}{13}\cdot\dfrac{5}{4}$

$=\dfrac{15}{13}$

Yanıt / The Answer is E

---

5. $\sqrt{1,44}-\sqrt[3]{0,027}+\sqrt[4]{0,0016}$

$=\sqrt{\dfrac{144}{100}}-\sqrt[3]{\dfrac{27}{1000}}+\sqrt[4]{\dfrac{16}{10000}}$

$=\dfrac{12}{10}-\dfrac{3}{10}+\dfrac{2}{10}$

$=\dfrac{11}{10}=1,1$

Yanıt / The Answer is B

---

6. $\sqrt[3]{-60-\sqrt{19-\sqrt[3]{8-(-19)}}}=\sqrt[3]{-60-\sqrt{19-\sqrt[3]{27}}}$

$=\sqrt[3]{-60-\sqrt{19-3}}$

$=\sqrt[3]{-60-4}$

$=\sqrt[3]{-64}=-4$

Yanıt / The Answer is A

7. $\left.\begin{array}{l} a=\sqrt{3} \\ b=\sqrt[3]{9} \\ c=\sqrt[4]{2} \end{array}\right\} \Rightarrow \begin{array}{l} a^{12}=3^{6} \\ b^{12}=9^{4}=3^{8} \\ c^{12}=2^{3} \end{array}$

$\Rightarrow b>a>c$

Yanıt / The Answer is C

8. $\sqrt{2000}\cdot x=A$

$20\sqrt{5}\cdot x=A \quad (A\in N)$

$\Rightarrow \min(x)=\sqrt{5}$

Yanıt / The Answer is C

9. $\sqrt[4]{2\sqrt{\frac{1}{2}\sqrt[3]{4}}}=\sqrt[4]{\sqrt{4\cdot\frac{1}{2}\sqrt[3]{4}}}$

$=\sqrt[4]{\sqrt{2\sqrt[3]{4}}}$

$=\sqrt[4]{\sqrt{\sqrt[3]{32}}}$

$=\sqrt[24]{32}$

Yanıt / The Answer is E

10. $\frac{\sqrt[3]{4}\cdot\sqrt[15]{2}}{\sqrt[5]{8}}=\sqrt[15]{2^{x}}$

$\frac{2^{\frac{2}{3}}\cdot 2^{\frac{1}{15}}}{2^{\frac{3}{5}}}=2^{\frac{x}{15}} \Rightarrow \frac{2}{3}+\frac{1}{15}-\frac{3}{5}=\frac{x}{15}$

$\frac{10+1-9}{15}=\frac{x}{15}$

$x=2$

Yanıt / The Answer is A

11. $\frac{1}{\sqrt{3}}+\frac{4}{\sqrt{27}}-\frac{4}{\sqrt{12}}=\frac{1}{\sqrt{3}}+\frac{4}{3\sqrt{3}}-\frac{4}{2\sqrt{3}}$

$=\frac{\sqrt{3}}{3}+\frac{4\sqrt{3}}{9}-\frac{4\sqrt{3}}{6}$

$=\frac{6\sqrt{3}+8\sqrt{3}-12\sqrt{3}}{18}$

$=\frac{2\sqrt{3}}{18}=\frac{\sqrt{3}}{9}$

Yanıt / The Answer is D

12. $\frac{\sqrt{5}}{\sqrt{10}+\sqrt{5}}+1=\frac{\sqrt{5}(\sqrt{10}-\sqrt{5})}{5}+1$

$=\frac{5(\sqrt{2}-1)}{5}+1$

$=\sqrt{2}-1+1$

$=\sqrt{2}$

Yanıt / The Answer is A

1. $\dfrac{\sqrt[4]{(-16)^2}-\sqrt[3]{-27}}{\sqrt{0,49}}=?$

A) 4 B) 5 C) 7 D) 8 E) 10

2. $\dfrac{\sqrt{a^5}\,\sqrt{b^3}}{\sqrt{ab}}=?$

A) a^2b B) a^3b C) ab^2 D) ab^3 E) a^2b^2

3. $\dfrac{2}{3-\sqrt{3}}+\dfrac{2}{3+\sqrt{3}}=?$

A) 0 B) $\frac{1}{2}$ C) 1 D) $\frac{3}{2}$ E) 2

4. $\sqrt[x]{0,\overline{3}}=\sqrt[3]{81^{-y}} \Rightarrow x\cdot y=?$

A) $\frac{1}{4}$ B) $\frac{3}{4}$ C) $\frac{5}{4}$ D) $\frac{7}{4}$ E) $\frac{9}{4}$

5. $x<0<y \Rightarrow$

$\dfrac{\sqrt[4]{(x-y)^4}+\sqrt[3]{x^3}}{\sqrt[5]{(x-y)^5}+\sqrt{y^2}}=?$

A) $x-y$ B) $-x$ C) $-y$ D) $\frac{y}{x}$ E) $\frac{x}{y}$

6. $\sqrt[3]{\dfrac{5^x+5^x+5^x+5^x+5^x}{4^x+4^x+4^x+4^x}}=\dfrac{64}{125} \Rightarrow x=?$

A) –11 B) –10 C) –9 D) –8 E) –7

7. $\sqrt{2x+1-2\sqrt{2x}} = 11 \Rightarrow \mathbf{x=?}$

A) 72 B) 76 C) 81
D) 90 E) 96

8. $\sqrt{\mathbf{209\cdot 239+225}} = \mathbf{?}$

A) 220 B) 221 C) 222
D) 223 E) 224

9. $x>0$,

$$\sqrt[3]{(x+12)\sqrt[3]{(x+12)\sqrt[3]{(x+12)\ldots}}} = x \Rightarrow \mathbf{x=?}$$

A) 2 B) 4 C) 6
D) 9 E) 12

10. $\sqrt{x+\sqrt{1+\sqrt{x+\sqrt{1+\ldots}}}} = 3 \Rightarrow \mathbf{x=?}$

A) 7 B) 8 C) 9
D) 10 E) 11

11. $\sqrt{\mathbf{7-4\cdot\sqrt{8-2\sqrt{7}}}} + \mathbf{3} - \frac{\mathbf{7}}{\sqrt{\mathbf{7}}} = \mathbf{?}$

A) 1 B) 2 C) 4
D) 7 E) 8

12. $\left.\begin{array}{l} x=\sqrt{2} \\ y=\sqrt[3]{5} \\ z=\sqrt[6]{10} \end{array}\right\} \Rightarrow \mathbf{?<?<?}$

A) $x<y<z$ B) $y<z<x$ C) $z<x<y$
D) $z<y<x$ E) $x<z<y$

YANITLAR / ANSWERS

1. E	**2. A**	**3. E**	**4. B**	**5. D**	**6. B**	**7. A**	**8. E**
9. B	**10. A**	**11. A**	**12. E**				

1. $\dfrac{\sqrt[4]{(-16)^2}-\sqrt[3]{-27}}{\sqrt{0,49}}=\dfrac{4-(-3)}{0,7}=\dfrac{7}{0,7}=10$

Yanıt / The Answer is E

---

2. $\dfrac{\sqrt{a^5}\,\sqrt{b^3}}{\sqrt{ab}}=\dfrac{\sqrt{a^4\cdot a}\cdot\sqrt{b^2\cdot b}}{\sqrt{ab}}$

$=\dfrac{a^2\sqrt{a}\cdot b\cdot\sqrt{b}}{\sqrt{ab}}$

$=a^2b$

Yanıt / The Answer is A

---

3. $\dfrac{2}{3-\sqrt{3}}+\dfrac{2}{3+\sqrt{3}}=\dfrac{2\cdot(3+\sqrt{3})+2\cdot(3-\sqrt{3})}{(3+\sqrt{3})\cdot(3-\sqrt{3})}$

$=\dfrac{6+2\sqrt{3}+6-2\sqrt{3}}{6}$

$=\dfrac{12}{6}=2$

Yanıt / The Answer is E

---

4. $\sqrt[x]{0,\overline{3}}=\sqrt[3]{81^{-y}}$

$3^{-\frac{1}{x}}=3^{-\frac{4y}{3}}$

$\dfrac{1}{x}=\dfrac{4y}{3}$

$4xy=3$

$xy=\dfrac{3}{4}$

Yanıt / The Answer is B

---

5. $x<0<y\ \Rightarrow$

$\dfrac{\sqrt[4]{(x-y)^4}+\sqrt[3]{x^3}}{\sqrt[5]{(x-y)^5}+\sqrt{y^2}}=\dfrac{|x-y|+x}{x-y+|y|}$

$=\dfrac{-(x-y)+x}{x-y+y}$

$=\dfrac{y}{x}$

Yanıt / The Answer is D

---

6. $\sqrt[3]{\dfrac{5^x+5^x+5^x+5^x+5^x}{4^x+4^x+4^x+4^x}}=\dfrac{64}{125}$

$\sqrt[3]{\dfrac{5^{x+1}}{4^{x+1}}}=\dfrac{64}{125}$

$\left(\dfrac{5}{4}\right)^{\frac{x+1}{3}}=\left(\dfrac{5}{4}\right)^{-3}$

$\dfrac{x+1}{3}=-3$

$x=-10$

Yanıt / The Answer is B

7. $\sqrt{2x+1-2\sqrt{2x}} = \sqrt{2x} - 1$

$\swarrow \searrow$

$2x \quad 1$

$$\sqrt{2x+1-2\sqrt{2x}} = 11$$

$$\sqrt{2x} - 1 = 11$$

$$\sqrt{2x} = 12$$

$$2x = 144$$

$$x = 72$$

Yanıt / The Answer is A

8. $t = 209 \Rightarrow \sqrt{t(t+30)+225} = \sqrt{t^2+30t+225}$

$$= t+15$$

$$= 209+15$$

$$= 224$$

Yanıt / The Answer is E

9. $\sqrt[3]{(x+12)\sqrt[3]{(x+12)\sqrt[3]{(x+12)\ldots}}} = x$

$$\sqrt{x+12} = x$$

$$x+12 = x^2$$

$\Rightarrow x^2 - x - 12 = 0$

$(x-4)\cdot(x+3) = 0$

$x_1 = 4, \; x_2 = -3$

$x > 0 \Rightarrow x = 4$

Yanıt / The Answer is B

10. $\sqrt{x+\sqrt{1+\sqrt{x+\sqrt{1+\ldots}}}} = 3$

$$\sqrt{x+\sqrt{1+\underbrace{\sqrt{x+\sqrt{1+\ldots}}}_{3}}} = 3$$

$$\sqrt{x+\sqrt{1+3}} = 3$$

$$\sqrt{x+2} = 3$$

$$x+2 = 9$$

$$x = 7$$

Yanıt / The Answer is A

11. $\sqrt{7-4\cdot\sqrt{8-2\sqrt{7}}} + 3 - \frac{7}{\sqrt{7}}$

$= \sqrt{7-4(\sqrt{7}-1)} + 3 - \sqrt{7}$

$= \sqrt{7-4\sqrt{7}+4} + 3 - \sqrt{7}$

$= \sqrt{11-2\sqrt{28}} + 3 - \sqrt{7}$

$= \sqrt{7} - 2 + 3 - \sqrt{7}$

$= 1$

Yanıt / The Answer is A

12.

$$\left.\begin{array}{l} x = \sqrt{2} \\ y = \sqrt[3]{5} \\ z = \sqrt[6]{10} \end{array}\right\} \Rightarrow \begin{array}{l} x^6 = 2^3 = 8 \\ y^6 = 5^2 = 25 \\ z^6 = 10 \end{array}$$

$\Rightarrow x < z < y$

Yanıt / The Answer is E

1. $\sqrt{1{,}6}+\sqrt{0{,}9}-\sqrt{0{,}4}=?$

Yanıt / The Answer is: $\dfrac{\sqrt{10}}{2}$

2. $\dfrac{\sqrt[3]{3^2}\cdot\sqrt{3}\cdot\sqrt[4]{3}}{\sqrt[6]{3}}=?$

Yanıt / The Answer is: $3\sqrt[4]{3}$

3. $\dfrac{3}{\sqrt{2}+\sqrt{3}}-\dfrac{2}{\sqrt{2}-\sqrt{3}}=a\sqrt{3}+b\sqrt{2}\Rightarrow a\cdot b=?$

Yanıt / The Answer is: **–5**

4. $\dfrac{1}{\sqrt[3]{5}-\sqrt[3]{4}}-\left(\sqrt[3]{25}+\sqrt[3]{16}\right)=?$

Yanıt / The Answer is: $\sqrt[3]{20}$

5. $\sqrt[3]{2\sqrt{4\sqrt[3]{2\sqrt{4\ldots}}}}=?$

Yanıt / The Answer is: $\sqrt[5]{2^4}$

6. $\sqrt[3]{\sqrt{\dfrac{3}{x}}\cdot\dfrac{x}{9}}=\sqrt[6]{3}\Rightarrow x=?$

Yanıt / The Answer is: **81**

7. $\sqrt{\frac{9}{4^{x-3}} + 4^{5-x}} = 40 \Rightarrow x = ?$

Yanıt / The Answer is: 0

8. $\frac{\sqrt{\sqrt{20}-\sqrt{5}+1}\cdot\sqrt{\sqrt{20}-\sqrt{5}-1}}{\sqrt{2}} = ?$

Yanıt / The Answer is: $\sqrt{2}$

9. $\sqrt{x+3}-\sqrt{x-5} = A \Rightarrow \sqrt{x+3}+\sqrt{x-5} = ?$

Yanıt / The Answer is: $\frac{8}{A}$

10. $\sqrt{9-4\sqrt{5}} - \sqrt{8-\sqrt{60}} - \frac{3}{\sqrt{3}} = ?$

Yanıt / The Answer is: –2

11. $\frac{\sqrt[3]{x\sqrt{x^5}}}{\sqrt{x\sqrt[3]{x}}} = \sqrt{2} \Rightarrow x = ?$

Yanıt / The Answer is: 2

12. $\sqrt{5^{x-1} + \frac{100}{5^{3-x}}} = \sqrt[4]{125} \Rightarrow x = ?$

Yanıt / The Answer is: $\frac{3}{2}$

1. $\frac{2}{\sqrt{3}}-\frac{3}{1+\sqrt{3}}+\frac{5}{2\sqrt{3}}=?$

A) $\frac{3}{2}$ B) $\frac{\sqrt{2}}{2}$ C) $\frac{\sqrt{3}}{2}$

D) $\frac{3\sqrt{3}}{2}$ E) $\frac{5\sqrt{3}}{2}$

2. $\sqrt{\frac{\sqrt{3}-1}{\sqrt{3}+1}}\cdot\left(\sqrt{3}+1\right)=?$

A) $\sqrt{2}$ B) $\sqrt{3}$ C) 3

D) $3\sqrt{3}$ E) 9

3. $\frac{6\sqrt{3}+6}{\sqrt{15}+\sqrt{6}+\sqrt{5}+\sqrt{2}}=x\cdot\left(\sqrt{5}-\sqrt{2}\right) \Rightarrow x=?$

A) 1 B) 2 C) 3

D) 4 E) 5

4. $2^x=\sqrt[4]{2\sqrt{\sqrt[3]{16}}} \Rightarrow 12\cdot x=?$

A) 1 B) 2 C) 3

D) 4 E) 5

5 $\sqrt[5]{16\sqrt[5]{16\sqrt[5]{16\ldots}}}+\sqrt{27:\sqrt{27:\sqrt{27:\ldots}}}=?$

A) 3 B) 5 C) 8

D) 9 E) 12

6. $\sqrt{x+\sqrt{x+\sqrt{x+\ldots}}}=\sqrt{12-\sqrt{12-\sqrt{12\ldots}}} \Rightarrow x=?$

A) 3 B) 4 C) 6

D) 9 E) 12

7. $\left(\sqrt{30-\sqrt{30-\sqrt{30-\ldots}}}\right)\cdot\left(\sqrt{20+\sqrt{20+\sqrt{20+\ldots}}}\right)=?$

A) 9 B) 16 C) 25 D) 36 E) 49

8. $\sqrt{8}\cdot\sqrt{9}\cdot\sqrt{10}\ \ldots\sqrt{x}=24\sqrt{165}\ \Rightarrow\ \mathbf{x=?}$

A) 11 B) 12 C) 13 D) 14 E) 15

9. $\sqrt{4-2\sqrt{3}}\cdot(\sqrt{3}+1)=?$

A) $\sqrt{2}$ B) $\sqrt{3}$ C) 2 D) 3 E) 4

10. $\sqrt{\frac{1}{25}+\frac{1}{30}+\frac{1}{144}}=?$

A) $\frac{7}{60}$ B) $\frac{11}{60}$ C) $\frac{13}{60}$ D) $\frac{17}{60}$ E) $\frac{19}{60}$

11. $a<0<b\ \Rightarrow$

$$\frac{\sqrt{(a-b)^2}-\sqrt[4]{a^4}}{\sqrt[3]{b^3}}=?$$

A) 1 B) a C) b D) $\frac{a}{b}$ E) $\frac{b}{a}$

12. $\frac{\sqrt{x}\cdot\sqrt[4]{y}+\sqrt[4]{x}\cdot\sqrt{y}}{\sqrt[4]{x}+\sqrt[4]{y}}=3\ \Rightarrow\ x\cdot y=?$

A) $\sqrt{3}$ B) 3 C) 9 D) 27 E) 81

YANITLAR / ANSWERS

1. A	2. A	3. B	4. E	5. B	6. C	7. C	8. B
9. C	10. D	11. A	12. E				

1. $\sqrt{11+2\sqrt{30}}\cdot\sqrt{11-2\sqrt{30}}=?$

A) 1
B) 2
C) 3
D) 4
E) 5

2. $\sqrt{x+\sqrt{x}}+\sqrt{x-\sqrt{x}}=4 \Rightarrow x=?$

A) $\frac{9}{4}$
B) $\frac{21}{8}$
C) $\frac{36}{11}$
D) $\frac{64}{15}$
E) $\frac{71}{18}$

3. $\sqrt{9+\sqrt{56}}-\sqrt{9-\sqrt{56}}=?$

A) $2\sqrt{2}$
B) $2\sqrt{7}$
C) $2\sqrt{14}$
D) $2\sqrt{21}$
E) $2\sqrt{42}$

4. $A \in R$,

$\sqrt{x-4}+\sqrt[5]{5-2x}+\sqrt[8]{7-x}=A \Rightarrow \sum x=?$

A) 11
B) 15
C) 22
D) 30
E) 33

5. $\sqrt[3]{8\sqrt[4]{8^3\sqrt{8^{-5}}}}=\sqrt[8]{2^x} \Rightarrow x=?$

A) 3
B) 4
C) 6
D) 8
E) 9

6. $\left(\frac{1}{5}\right)^{x+2}=\sqrt[3]{5^{9-6y}} \Rightarrow 2y-x=?$

A) 1
B) 2
C) 3
D) 4
E) 5

7. $\sqrt[4]{7-2\sqrt{10}} \cdot \sqrt{\sqrt{5}+\sqrt{2}} = ?$

A) $\sqrt{2}$ B) $\sqrt{3}$ C) 2
D) $\sqrt{5}$ E) $\sqrt{7}$

8. $\frac{1}{2\sqrt{x}} + \frac{\sqrt{x}+1}{x+\sqrt{x}} = 3 \Rightarrow x = ?$

A) $\frac{1}{2}$ B) $\frac{1}{3}$ C) $\frac{1}{4}$
D) $\frac{1}{5}$ E) $\frac{1}{6}$

9. $\sqrt{9+4\sqrt{5}} - \sqrt{7-2\sqrt{10}} = ?$

A) $2-\sqrt{5}$
B) $1+\sqrt{5}$
C) $2+\sqrt{2}$
D) $2+\sqrt{5}$
E) $\sqrt{2}-2\sqrt{5}$

10. $\frac{\sqrt{10+\sqrt{84}}+\sqrt{10-\sqrt{84}}}{\sqrt{7}} = ?$

A) 1 B) 2 C) 3
D) 4 E) 5

11. $\sqrt{x-1}+\sqrt{x+1}=\sqrt{2x+2} \Rightarrow x = ?$

A) $\frac{\sqrt{2}}{5}$ B) $\frac{\sqrt{2}}{4}$ C) $\frac{\sqrt{2}}{3}$
D) $\frac{\sqrt{2}}{2}$ E) $\sqrt{2}$

12. $\left(\sqrt{3}-2\right)^{12} \cdot \left(\sqrt{3}+2\right)^{11} + \sqrt{3} = ?$

A) 5 B) 4 C) 3
D) 2 E) 1

YANITLAR / ANSWERS

1. A	2. D	3. A	4. C	5. E	6. E	7. B	8. C
9. C	10. B	11. E	12. D				

1. $\sqrt{3+x}+\sqrt{3-x}=\sqrt{10} \Rightarrow$ **ÇK(SS) = ?**

A) $\{-\sqrt{2},\sqrt{2}\}$

B) $\{-\sqrt{3},\sqrt{3}\}$

C) $\{-\sqrt{5},\sqrt{5}\}$

D) $\{-\sqrt{7},\sqrt{7}\}$

E) $\{-\sqrt{10},\sqrt{10}\}$

2. $\sqrt{7-\sqrt{48}}+\sqrt{7+\sqrt{48}}=?$

A) 1

B) 2

C) 3

D) 4

E) 5

3. $(\sqrt{2}+\sqrt{5}+\sqrt{7})^2\cdot(\sqrt{2}+\sqrt{5}-\sqrt{7})^2=?$

A) 10

B) 20

C) 30

D) 40

E) 50

4. $\sqrt[4]{5-2\sqrt{6}}\cdot\sqrt[4]{5+2\sqrt{6}}=?$

A) $4\sqrt{3}$

B) $\sqrt[4]{2}$

C) 1

D) $\sqrt{2}$

E) $\sqrt{3}$

5. $\sqrt[3]{\sqrt[4]{x}}+\sqrt{\sqrt[6]{x}}=2\sqrt[3]{3} \Rightarrow x=?$

A) 3

B) 6

C) 9

D) 27

E) 81

6. $\sqrt{4+2\sqrt{3}}-1=2\sqrt{x} \Rightarrow x=?$

A) $\frac{1}{4}$

B) $\frac{3}{4}$

C) $\frac{5}{4}$

D) $\frac{9}{4}$

E) $\frac{15}{4}$

7. $\dfrac{\sqrt{\sqrt{3\sqrt{3}}}}{\sqrt[3]{\sqrt{3}}} = 243^{x} \Rightarrow x = ?$

A) $\dfrac{1}{12}$

B) $\dfrac{1}{18}$

C) $\dfrac{1}{24}$

D) $\dfrac{1}{36}$

E) $\dfrac{1}{48}$

8. $\dfrac{\sqrt{\sqrt{5}+\sqrt{2+\sqrt{5}}}\cdot\sqrt{\sqrt{5}-\sqrt{2+\sqrt{5}}}\cdot\sqrt{3+\sqrt{5}}}{\sqrt{2}} = ?$

A) 1

B) $\sqrt{2}$

C) $\sqrt{3}$

D) $2\sqrt{2}$

E) $\sqrt{5}$

9. $x = \dfrac{\sqrt{3}+\sqrt{2}}{\sqrt{2}-1} \Rightarrow \dfrac{\sqrt{3}-\sqrt{2}}{\sqrt{2}+1} = ?$

A) $3x$

B) $2x$

C) x

D) $\dfrac{1}{x}$

E) $\dfrac{2}{x}$

10. $\sqrt{5+2\sqrt{3-\sqrt{8}}} - 1 = ?$

A) $\sqrt{2}$

B) $\sqrt{3}$

C) $2\sqrt{2}$

D) $\sqrt{5}$

E) $2\sqrt{5}$

11. $\sqrt{25^{3x+1}} = 125\sqrt{5^{6x-2y}} \Rightarrow y = ?$

A) –1

B) 1

C) 2

D) 4

E) 6

12. $\sqrt[3]{5\sqrt{3\sqrt[3]{5\sqrt{3\ldots}}}} = ?$

A) $\sqrt[5]{75}$

B) $\sqrt[5]{45}$

C) $\sqrt[5]{30}$

D) $\sqrt[5]{15}$

E) $\sqrt[5]{5}$

YANITLAR / ANSWERS

1. C	2. D	3. D	4. C	5. E	6. B	7. C	8. B
9. D	10. A	11. C	12. A				

1. $\sqrt[3]{-16}-\sqrt[3]{54}-\sqrt[3]{-128}=?$

A) $-\sqrt[3]{2}$

B) $\sqrt[3]{2}$

C) $2\sqrt[3]{2}$

D) $3\sqrt[3]{2}$

E) $4\sqrt[3]{2}$

2. $\dfrac{\sqrt{1,2}+\sqrt{7,5}}{\sqrt{4,8}}=?$

A) $\frac{3}{4}$

B) $\frac{5}{4}$

C) $\frac{7}{4}$

D) $\frac{9}{4}$

E) $\frac{11}{4}$

3. $\dfrac{\sqrt{0,75}-\sqrt{0,12}+\sqrt{2,43}}{\sqrt{0,48}}=?$

A) -1

B) 2

C) 3

D) 6

E) 9

4. $\sqrt[3]{3\sqrt{2}}\cdot\sqrt[3]{2\sqrt{3}}=?$

A) 1

B) $\sqrt{2}$

C) $\sqrt{3}$

D) $\sqrt{5}$

E) $\sqrt{6}$

5. $\left.\begin{aligned}\sqrt[3]{2^x}&=b\\ \sqrt{2^y}&=b^3\end{aligned}\right\}\Rightarrow 2^{2x-y}=?$

A) $\frac{1}{4}$

B) $\frac{1}{2}$

C) 1

D) 2

E) 4

6. $\sqrt[x]{3}=\dfrac{3^x\cdot\sqrt[3]{3}}{27}\Rightarrow x=?$

A) 1

B) 2

C) 3

D) 4

E) 5

7. $\sqrt{x+9-6\sqrt{x}}=2 \Rightarrow$ **ÇK(SS) = ?**

A) $\left\{1, -\frac{5}{7}\right\}$

B) $\left\{\frac{5}{7}\right\}$

C) $\left\{-1, \frac{5}{7}\right\}$

D) $\left\{1, \frac{5}{7}\right\}$

E) $\{1, 25\}$

8. $\frac{\sqrt{5}-\sqrt{3}}{\sqrt{5}+\sqrt{3}}+\frac{\sqrt{5}+\sqrt{3}}{\sqrt{5}-\sqrt{3}}=?$

A) 7

B) 8

C) 9

D) 10

E) 11

9. $\frac{3}{\sqrt{3}-2}+\frac{5}{2+\sqrt{3}}+\frac{24}{\sqrt{3}}=?$

A) 1

B) 2

C) 3

D) 4

E) 5

10. $\frac{\sqrt{24}-5}{\sqrt{3}-\sqrt{2}}+\sqrt{3}=?$

A) $\sqrt{2}$

B) $2\sqrt{2}$

C) $\sqrt{3}$

D) $2\sqrt{3}$

E) $3\sqrt{3}$

11. $\left.\begin{array}{l} x=\sqrt[3]{4} \\ y=\sqrt[4]{8} \\ z=\sqrt{6} \end{array}\right\} \Rightarrow\ ?<?<?$

A) $z<y<x$

B) $y<z<x$

C) $z<x<y$

D) $y<x<z$

E) $x<y<z$

12. $\frac{2}{\sqrt{2}+1}+\frac{3}{\sqrt{3}+\sqrt{2}}+\frac{3}{2+\sqrt{3}}+\frac{2}{\sqrt{2}}=?$

A) 4

B) 6

C) 8

D) 10

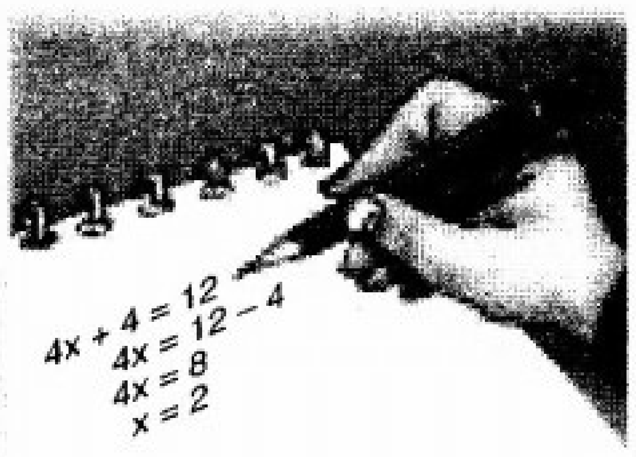
E) 12

YANITLAR / ANSWERS

1. A	**2. C**	**3. C**	**4. E**	**5. C**	**6. C**	**7. E**	**8. B**
9. D	**10. A**	**11. E**	**12. A**				

ÜNİTE 4

UNIT

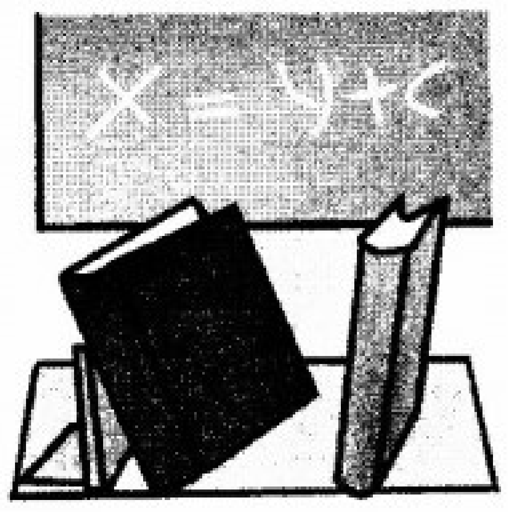


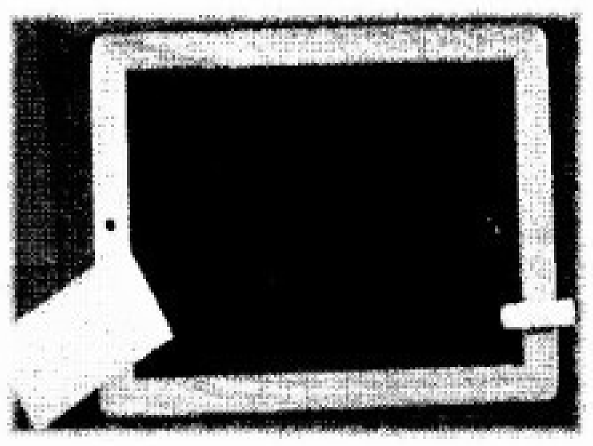
Bu ünitede; birinci dereceden denklem, birinci dereceden eşitsizlik ve mutlak değer konuları ayrıntılı anlatılmıştır. Bu ünitede anlatılan konular ikinci dereceden denklem ve eşitsizliklerin temelini oluşturacağından öğrencilerin, bu ünitede anlatılan konuları iyi öğrenmeleri gerekmektedir.

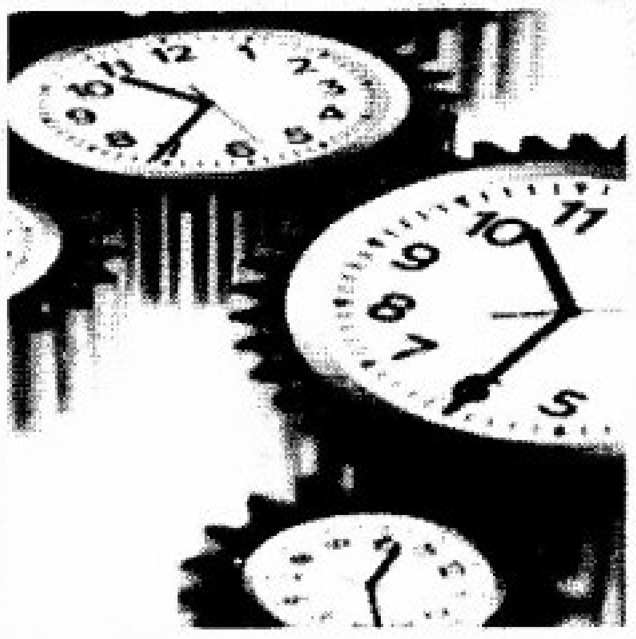
Bu ünite, 76 çözümlü örnek, 36 alıştırma, 96 test sorusu içermektedir.

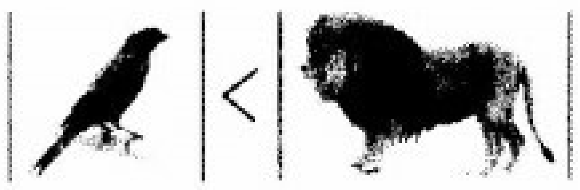
In this unit, first order equation, first order inequality, and absolute value are explained in detailed. These concepts are very important. Because inequalities are necessary in quadratic equations and inequalities.

This unit includes; 96 test questions.









◆ **BİRİNCİ DERECEDEN DENKLEMLER / DOĞRUSAL DENKLEMLER**
FIRST ORDER EQUATIONS / LINEAR EQUATIONS .... 179 – 199

◆ **BİRİNCİ DERECEDEN EŞİTSİZLİKLER / DOĞRUSAL EŞİTSİZLİKLER**
FIRST ORDER INEQUALITIES / LINEAR INEQUALITIES .... 199 – 214

◆ **MUTLAK DEĞER**
ABSOLUTE VALUE .... 215 – 236

1. $4(3x-2)+5(2-3x)=x-6 \Rightarrow \mathbf{x=?}$

A) 1 B) 2 C) 3 D) 4 E) 5

2. $3(x-2)+5=3x+7 \Rightarrow$ **ÇK(SS) = ?**

A) {1} B) {3} C) {5} D) ∅ E) R

3. $\dfrac{2x+1}{x-2}+\dfrac{x-3}{2-x}=2 \Rightarrow \mathbf{x=?}$

A) 0 B) 2 C) 4 D) 6 E) 8

4. $\dfrac{5}{2x}-\dfrac{4}{3x}+\dfrac{3}{x}=\dfrac{5}{12} \Rightarrow \mathbf{x=?}$

A) –10 B) –5 C) 0 D) 5 E) 10

5. $2-\dfrac{x}{3+\dfrac{x-1}{2}}=\dfrac{5}{3} \Rightarrow \mathbf{x=?}$

A) –7 B) –5 C) –2 D) 1 E) 3

6. $a, b \in \mathbb{R}$,

$$\left.\begin{array}{l} ax-by=-11 \\ bx+ay=10 \end{array}\right\},\ \text{ÇK(SS)}=\{(-1,4)\} \Rightarrow \mathbf{a+b=?}$$

A) –3 B) –1 C) 3 D) 5 E) 7

7. $$\left.\begin{array}{l} x+y=9 \\ y+z=7 \\ x+z=4 \end{array}\right\} \Rightarrow \mathbf{x=?}$$

A) 1 B) 2 C) 3 D) 5 E) 6

8. $(2x+y+4)^2+(3x-y+1)^2=0 \Rightarrow \mathbf{x+y=?}$

A) –6 B) –5 C) –4 D) –3 E) –2

9. $$\left.\frac{x^2-25}{x+5}=x-5\right\} \Rightarrow \mathbf{ÇK(SS)=?}$$

A) ∅ B) {–1, 1} C) R D) {–5, 5} E) R – {–5}

10. $$\left.\begin{array}{l} 2a+b-c=5 \\ -a+b+5c=2 \end{array}\right\} \Rightarrow \mathbf{a+b+c=?}$$

A) 2 B) 4 C) 5 D) 6 E) 8

11. $$\left.\begin{array}{l} \frac{4}{x}-\frac{2}{y}=-\frac{1}{5} \\ \frac{3}{x}+\frac{1}{y}=\frac{11}{10} \end{array}\right\} \Rightarrow \mathbf{x+y=?}$$

A) 1 B) 3 C) 5 D) 7 E) 9

12. a, b, c ∈ R^+

$$\left.\begin{array}{l} a\cdot b=27 \\ b\cdot c=6 \\ a\cdot c=8 \end{array}\right\} \Rightarrow \mathbf{c=?}$$

A) $\frac{1}{3}$ B) $\frac{2}{3}$ C) $\frac{4}{3}$ D) $\frac{5}{3}$ E) $\frac{7}{3}$

YANITLAR / ANSWERS

1. B	2. D	3. E	4. E	5. D	6. D	7. C	8. D
9. E	10. B	11. D	12. C				

1. $4(3x-2)+5(2-3x)=x-6$

$$12x-8+10-15x=x-6$$
$$-3x+2=x-6$$
$$8=4x$$
$$x=2$$

Yanıt / The Answer is B

2. $3(x-2)+5=3x+7$

$$3x-6+5=3x+7$$
$$3x-1=3x+7$$
$$0\neq 8$$
$$\Rightarrow \text{ÇK(SS)}=\varnothing$$

Yanıt / The Answer is D

3. $\dfrac{2x+1}{x-2}+\dfrac{x-3}{2-x}=2$

$$\frac{2x+1}{x-2}-\frac{x-3}{x-2}=2$$
$$\frac{2x+1-x+3}{x-2}=2$$
$$x+4=2x-4$$
$$x=8$$

Yanıt / The Answer is E

4. $\dfrac{5}{2x}-\dfrac{4}{3x}+\dfrac{3}{x}=\dfrac{5}{12}$

$$\frac{15-8+18}{6x}=\frac{5}{12}$$
$$\frac{25}{6x}=\frac{5}{12}$$
$$x=10$$

Yanıt / The Answer is E

5. $2-\dfrac{x}{3+\dfrac{x-1}{2}}=\dfrac{5}{3}$

$$2-\frac{x}{\dfrac{x+5}{2}}=\frac{5}{3}$$
$$2-\frac{2x}{x+5}=\frac{5}{3}$$
$$2-\frac{5}{3}=\frac{2x}{x+5}$$
$$\frac{1}{3}=\frac{2x}{x+5}$$
$$x+5=6x$$
$$5x=5$$
$$x=1$$

Yanıt / The Answer is D

6.
$$\left.\begin{array}{l} ax-by=-11 \\ bx+ay=10 \\ \text{ÇK(SS)}=\{(-1,4)\} \end{array}\right\} \Rightarrow \begin{array}{l} -a-4b=-11 \\ -b+4a=10 \end{array}$$

$$\left.\begin{array}{l} -a-4b=-11 \\ -b+4a=10 \end{array}\right\} \Rightarrow \begin{array}{l} -17b=-34 \\ b=2 \end{array}$$

$$b=2 \Rightarrow -a-4\cdot 2=-11 \Rightarrow a=3$$
$$\Rightarrow a+b=5$$

Yanıt / The Answer is D

7.
$$\left.\begin{array}{l}x+y=9\\y+z=7\\x+z=4\end{array}\right\}\Rightarrow\begin{array}{r}x+y=9\\-y-z=-7\\+\quad x+z=4\\\hline 2x=6\end{array}$$

$$\frac{2x}{2}=\frac{6}{2}$$

$$x=3$$

Yanıt / The Answer is C

8. $(2x+y+4)^2+(3x-y+1)^2=0$

$$\begin{array}{r}2x+y+4=0\\+\quad 3x-y+1=0\\\hline 5x=-5\\x=-1\end{array}$$

$\Rightarrow x+y=-3$

Yanıt / The Answer is D

9. $\dfrac{x^2-25}{x+5}=x-5$

$x^2-25=(x-5)\cdot(x+5)$

$(x-5)\cdot(x+5)=(x-5)\cdot(x+5)$

$1=1 \Rightarrow \text{ÇK(SS)}=R-\{-5\}$

Yanıt / The Answer is E

10. $2a+b-c=5 \Rightarrow 4a+2b-2c=10$

$$\begin{array}{r}-a+b+5c=2\\+\quad 4a+2b-2c=10\\\hline 3a+3b+3c=12\\a+b+c=4\end{array}$$

Yanıt / The Answer is B

11. $\dfrac{3}{x}+\dfrac{1}{y}=\dfrac{11}{10} \Rightarrow \dfrac{6}{x}+\dfrac{2}{y}=\dfrac{11}{5}$

$$\left.\begin{array}{l}\dfrac{4}{x}-\dfrac{2}{y}=-\dfrac{1}{5}\\[2ex]\dfrac{6}{x}+\dfrac{2}{y}=\dfrac{11}{5}\end{array}\right\}\Rightarrow\frac{10}{x}=2\Rightarrow x=5$$

$x=5 \Rightarrow \dfrac{4}{5}-\dfrac{2}{y}=-\dfrac{1}{5} \Rightarrow y=2$

$\Rightarrow x+y=5+2=7$

Yanıt / The Answer is D

12. a, b, c ∈ R^+

$$\left.\begin{array}{l}a\cdot b=27\\b\cdot c=6\\a\cdot c=8\end{array}\right\}\Rightarrow\begin{array}{c}a^2\cdot b^2\cdot c^2=9^2\cdot 4^2\\abc=36\end{array}$$

$a\cdot b=27 \Rightarrow c=\dfrac{36}{27}=\dfrac{4}{3}$

Yanıt / The Answer is C

1. $\frac{x-2}{4}-3=\frac{1}{4} \Rightarrow \mathbf{x=?}$

Yanıt / The Answer is: **15**

2. $\left.\begin{array}{l}4x-y+z=10\\2x-3y-z=18\end{array}\right\} \Rightarrow \mathbf{x+y+z=?}$

Yanıt / The Answer is: **–4**

3. $\left.\begin{array}{l}x+y=12\\y+z=9\\x+z=7\end{array}\right\} \Rightarrow \mathbf{x=?}$

Yanıt / The Answer is: **5**

4. $\left.\begin{array}{l}3a-b+4c=12\\6a-3b+8c=4\end{array}\right\} \Rightarrow \mathbf{b=?}$

Yanıt / The Answer is: **20**

5. $2x+1-[x-(4x-2)]+3=17 \Rightarrow \mathbf{x=?}$

Yanıt / The Answer is: **3**

6. $x-[x-(3x+2)]=3x+9 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is: ∅

7. $\left.\begin{array}{l} \dfrac{15}{x+y}-\dfrac{6}{x-y}=9 \\ \dfrac{5}{x+y}+\dfrac{4}{x-y}=-3 \end{array}\right\} \Rightarrow \mathbf{x=?}$

Yanıt / The Answer is: **2**

8. $\left.\begin{array}{l} 3x-y+z=12 \\ x+3y+2z=4 \end{array}\right\} \Rightarrow \mathbf{x+y+z=?}$

Yanıt / The Answer is: **4**

9. $\left.\begin{array}{l} x-y+z=3 \\ 2x+y+z=5 \\ 6x+3y+2z=10 \end{array}\right\} \Rightarrow \mathbf{y=?}$

Yanıt / The Answer is: $\mathbf{\dfrac{4}{3}}$

10. $x^2-[(x-2)x-2(3-x)]=5 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is: $\varnothing$

11. $\left.\begin{array}{l} \dfrac{2}{x-y}+\dfrac{3}{x+y}=2 \\ \dfrac{1}{x-y}+\dfrac{2}{x+y}=\dfrac{7}{6} \end{array}\right\} \Rightarrow \mathbf{x^2-y^2=?}$

Yanıt / The Answer is: **6**

12. $\left.\begin{array}{l} \dfrac{1}{x}+\dfrac{1}{y}=5 \\ \dfrac{1}{x}+\dfrac{1}{z}=3 \\ \dfrac{1}{y}+\dfrac{1}{z}=4 \end{array}\right\} \Rightarrow \mathbf{x=?}$

Yanıt / The Answer is: $\mathbf{\dfrac{1}{2}}$

1. $5(3x-1)-3(2x+5)=7 \Rightarrow \mathbf{x = ?}$

A) 1

B) 2

C) 3

D) 4

E) 5

2. $x-[4-3(x-2)]=10 \Rightarrow \mathbf{x = ?}$

A) 3

B) 5

C) 7

D) 9

E) 11

3. $\frac{3x}{2}-20=\frac{2x}{3}-5 \Rightarrow \mathbf{x = ?}$

A) 17

B) 18

C) 19

D) 20

E) 21

4. $\frac{2x-1}{3}-\frac{4x+1}{2}=-\frac{45}{6} \Rightarrow \mathbf{x = ?}$

A) 2

B) 5

C) 8

D) 11

E) 14

5. $\frac{2}{3x}+\frac{1}{x}-\frac{3}{4x}=\frac{11}{24} \Rightarrow \mathbf{x = ?}$

A) –3

B) –2

C) –1

D) 1

E) 2

6. $1+\cfrac{x}{2+\cfrac{x-1}{3}}=\frac{17}{8} \Rightarrow \mathbf{x = ?}$

A) 3

B) 4

C) 5

D) 6

E) 7

7. $1+\cfrac{6}{1+\cfrac{4}{2+\cfrac{x-1}{5}}}=4 \;\Rightarrow\; \mathbf{x=?}$

A) 4

B) 5

C) 7

D) 8

E) 11

8. $1+\dfrac{3}{2x+1}=2-\dfrac{x}{2x+1} \;\Rightarrow\; \mathbf{x=?}$

A) –4

B) –2

C) 2

D) 4

E) 6

9. $\dfrac{x}{a}+1=\dfrac{x-b}{2} \;\Rightarrow\; \mathbf{x=?}$

A) $\dfrac{a(b+2)}{a-2}$

B) $\dfrac{b(a-2)}{a+2}$

C) $\dfrac{b(a+2)}{a-2}$

D) $\dfrac{ab}{b+2}$

E) $\dfrac{ab}{b-2}$

10. $a \in R$,

$3(x-2)+4(x+a)=28$,

$ÇK(SS)=\{2\} \;\Rightarrow\; \mathbf{a=?}$

A) –4

B) –1

C) 3

D) 5

E) 6

11. $(a-2)x+(b+3)x=0$,

$ÇK(SS)=R \;\Rightarrow\; \mathbf{a \cdot b=?}$

A) –6

B) –3

C) 0

D) 3

E) 6

12. $(2a+b-1)x+(3a-b-4)y=0$,

$ÇK(SS)=R \;\Rightarrow\; \mathbf{(a, b)=?}$

A) (1, –1)

B) (2, 0)

C) (–2, 1)

D) (2, 1)

E) (–1, –3)

YANITLAR / ANSWERS

1. C	**2. B**	**3. B**	**4. B**	**5. E**	**6. A**	**7. E**	**8. C**
9. A	**10. D**	**11. A**	**12. A**				

1. $x + 2 - 3\,[4x - (2 - 3x)] = 6\,(4 - 3x) \Rightarrow \mathbf{x = ?}$

A) –8

B) –6

C) –4

D) –2

E) 2

2. $\left.\begin{aligned} x-y-z&=4\\ x+y-z&=8\\ x+2y+z&=13\end{aligned}\right\} \Rightarrow \mathbf{x+y+z=?}$

A) 5

B) 7

C) 9

D) 11

E) 13

3. $\dfrac{3x-1}{2x}+\dfrac{4x+3}{3x}=3 \Rightarrow \mathbf{x=?}$

A) 1

B) 2

C) 3

D) 4

E) 5

4. $\dfrac{x}{3}+\dfrac{y}{4}=2x-y=2 \Rightarrow \mathbf{x\cdot y=?}$

A) 6

B) 8

C) 9

D) 12

E) 16

5. a, b ∈ R,

$\left.\begin{aligned} ax-by&=8\\ bx+ay&=-2\end{aligned}\right\},\ \text{ÇK(SS)}=\{(1,-1)\} \Rightarrow \mathbf{a+2b=?}$

A) 7

B) 11

C) 13

D) 15

E) 17

6. $\left.\begin{aligned} \frac{2}{x}+\frac{4}{y}&=-\frac{1}{3}\\ \frac{5}{x}+\frac{1}{y}&=\frac{13}{6}\end{aligned}\right\} \Rightarrow \mathbf{x\cdot y=?}$

A) –6

B) –4

C) –3

D) 2

E) 4

7. $\left.\begin{array}{l} \dfrac{3}{x}+\dfrac{1}{y}=\dfrac{14}{15} \\ \dfrac{2}{x}-\dfrac{3}{y}=-\dfrac{3}{5} \end{array}\right\} \Rightarrow \mathbf{x+y=?}$

A) 7

B) 8

C) 9

D) 10

E) 11

8. $\left.\begin{array}{l} \dfrac{a}{a-b}=x+1 \\ \dfrac{3a}{a-b}=2x-3 \end{array}\right\} \Rightarrow \mathbf{x=?}$

A) –6

B) –3

C) 1

D) 3

E) 6

9. $x, y \in Z$,

$\dfrac{1}{x+5}+\dfrac{1}{y-4}=1 \Rightarrow \mathbf{x+y=?}$

A) –2 B) –1 C) 0

D) 1 E) 3

10. $\left.\begin{array}{l} ax+by=4 \\ 3x-2y=1 \end{array}\right\}$, $ÇK(SS)=R \Rightarrow \mathbf{a+b=?}$

A) 4

B) 8

C) 12

D) 16

E) 20

11. $\left.\begin{array}{l} a-4b+5c=8 \\ 2a+b-3c=10 \\ 4a-3b+2c=14 \end{array}\right\} \Rightarrow \mathbf{a = ?}$

A) –2

B) –3

C) –4

D) –7

E) –10

12. $\left.\begin{array}{l} \dfrac{5}{x}-y=3 \\ x-\dfrac{5}{y}=4 \end{array}\right\} \Rightarrow \mathbf{\dfrac{x}{y}=?}$

A) $\dfrac{4}{3}$ B) 1 C) $\dfrac{3}{4}$

D) $-\dfrac{3}{4}$ E) $-\dfrac{4}{3}$

YANITLAR / ANSWERS

1. A	**2. D**	**3. C**	**4. D**	**5. B**	**6. A**	**7. B**	**8. A**
9. E	**10. A**	**11. C**	**12. E**				

1. $\left.\begin{array}{l} 3x-2y+z=5 \\ x-y+3z=9 \\ -4x+5y-6z=13 \end{array}\right\} \Rightarrow \mathbf{x+y+z=?}$

A) 36
B) 38
C) 41
D) 43
E) 44

2. $\left.\begin{array}{l} x-y+4z=8 \\ 2x-y+2z=9 \\ 2x-2y-z=5 \end{array}\right\} \Rightarrow \mathbf{x+y+z=?}$

A) 3
B) 5
C) 6
D) 7
E) 8

3. $\dfrac{2x+1}{3}+\dfrac{4x+2}{4}=\dfrac{8x+1}{6} \Rightarrow \mathbf{x=?}$

A) –6
B) –4
C) –2
D) 2
E) 4

4. $\dfrac{3x-1}{4x}-\dfrac{x+2}{6x}=\dfrac{1}{2} \Rightarrow \mathbf{x=?}$

A) 3
B) 4
C) 5
D) 6
E) 7

5. $\dfrac{2x-1}{x-2}+\dfrac{6}{x}=\dfrac{3}{x-2}+\dfrac{x-4}{4-x} \Rightarrow \mathbf{x=?}$

A) –9
B) –5
C) –3
D) –2
E) 1

6. $\dfrac{3}{x+1}+\dfrac{1}{x-1}=\dfrac{x}{x-1} \Rightarrow \mathbf{x=?}$

A) –3
B) 2
C) 5
D) 9
E) 12

7. $\left.\begin{array}{l} x+3y=7 \\ x-z=2 \\ 3y-z=-3 \end{array}\right\} \Rightarrow \mathbf{x=?}$

A) 2

B) 4

C) 6

D) 8

E) 10

8. $\left.\begin{array}{l} \dfrac{2}{x}+\dfrac{5}{y}=\dfrac{7}{12} \\ \dfrac{3}{x}-\dfrac{2}{y}=-\dfrac{3}{2} \end{array}\right\} \Rightarrow \mathbf{x+y=?}$

A) –1

B) 0

C) 1

D) 2

E) 3

9. $a \in R$,

$\dfrac{3}{x-1}+\dfrac{a}{x+2}=\dfrac{a+2}{x+1}$, ÇK(SS) = {2} $\Rightarrow$ **a = ?**

A) 22 B) 24 C) 26

D) 28 E) 30

10. $2+\dfrac{2}{4-\dfrac{1}{x-1}}=3 \Rightarrow \mathbf{x=?}$

A) $\frac{1}{2}$

B) $\frac{3}{2}$

C) $\frac{5}{2}$

D) $\frac{7}{2}$

E) $\frac{9}{2}$

11. $\left.\begin{array}{l} 3x+2y=0 \\ x-y=-1 \end{array}\right\} \Rightarrow \mathbf{x+y=?}$

A) $\frac{1}{5}$

B) $\frac{2}{5}$

C) $\frac{4}{5}$

D) 1

E) $\frac{8}{5}$

12. $x=\dfrac{3y-1}{y-1} \Rightarrow \mathbf{y=?}$

A) $\dfrac{x-1}{3x+2}$ B) $\dfrac{x+1}{3x-2}$ C) $\dfrac{x-1}{x-3}$

D) $\dfrac{x+1}{x-3}$ E) $\dfrac{x+2}{x-5}$

YANITLAR / ANSWERS							
1. A	**2. B**	**3. C**	**4. E**	**5. D**	**6. B**	**7. C**	**8. C**
9. D	**10. B**	**11. A**	**12. C**				

1. $x \in Z$,

$$\frac{x}{3} - \frac{x+2}{2} < 5 \Rightarrow \min(x) = ?$$

A) –38 B) –37 C) –36 D) –35 E) –34

2. $x \in Z$,

$$2 \le \frac{4x+1}{3} < 5 \Rightarrow \sum x = ?$$

A) 5 B) 8 C) 12 D) 20 E) 22

3. $x \in Z$,

$$\frac{3-x}{2} - \frac{2+x}{3} < 3 \Rightarrow \min(x) = ?$$

A) –4 B) –3 C) –2 D) –1 E) 0

4. $x \in Z$,

$$2x - 3 < x + 7 \le 3x + 5 \Rightarrow \sum x = ?$$

A) 45 B) 48 C) 50 D) 55 E) 57

5. $-x - 1 < 3x + 7 \le 2x + 8 \Rightarrow$ **ÇK(SS) = ?**

A) (–1, 2) B) (–2, 1] C) (–2, 3] D) (–3, 4] E) (–3, 5)

6. $y \in Z$,

$$\left.\begin{array}{l} -3 \le x < 10 \\ 2x + 5y = 24 \end{array}\right\} \Rightarrow \sum y = ?$$

A) 20 B) 21 C) 22 D) 23 E) 24

7. $\dfrac{x^2+1}{x-3} < 0 \Rightarrow$ **ÇK(SS) = ?**

A) $(-\infty, 3)$ B) $(-\infty, 2)$ C) $(-\infty, 1)$

D) $(-\infty, 0)$ E) $(-\infty, -1)$

8. $x \in Z$,

$$\frac{3}{5} < \frac{2}{x} < \frac{6}{5} \Rightarrow \sum x = ?$$

A) 4 B) 5 C) 6

D) 7 E) 8

9. $x, y, z \in Z$,

$$\left.\begin{aligned} x+y &> 4 \\ x+z &< 5 \\ y+z &> 3 \end{aligned}\right\} \Rightarrow \min(y) = ?$$

A) 0 B) 1 C) 2

D) 3 E) 4

10. $x, y \in Z$,

$$\left.\begin{aligned} -3 < x < 4 \\ 1 < y < 5 \end{aligned}\right\} \Rightarrow \min(2x-y) = ?$$

A) –10 B) –8 C) –6

D) –4 E) –2

11. $(2x-y) \in Z$,

$$\left.\begin{aligned} -3 < x < 4 \\ 1 < y < 5 \end{aligned}\right\} \Rightarrow \min(2x-y) = ?$$

A) –10 B) –8 C) –6

D) –4 E) –2

12. $$\left.\begin{aligned} 2x+3 &\le 1 \\ 5 &< 3x+11 \end{aligned}\right\} \Rightarrow \text{ÇK(SS)} = ?$$

A) $[-3, -2]$ B) $(-2, -1]$ C) $[0, 1)$

D) $(1, 2)$ E) $(2, 3]$

YANITLAR / ANSWERS							
1. D	2. A	3. C	4. A	5. B	6. B	7. A	8. B
9. C	10. B	11. A	12. B				

1. $\frac{x}{3}-\frac{x+2}{2}<5$

$2x-3x-6<30$

$-x<36$

$x>-36$

$\Rightarrow \min(x)=-35$

Yanıt / The Answer is D

2. $2\le\frac{4x+1}{3}<5$

$6\le 4x+1<15$

$5\le 4x<14$

$\frac{5}{4}\le x<\frac{14}{4}$

$x\in Z \Rightarrow \sum x=2+3=5$

Yanıt / The Answer is A

3. $\frac{3-x}{2}-\frac{2+x}{3}<3$

$9-3x-4-2x<18$

$5-5x<18$

$5x>-13$

$x>-\frac{13}{5}$

$x\in Z \Rightarrow \min(x)=-2$

Yanıt / The Answer is C

4.

$$\begin{tikzcd}
& 2x-3<x+7\le 3x+5 \arrow[dl] \arrow[dr] & \\
\begin{array}{c}2x-3<x+7\\ x<10\end{array} \arrow[dr] & & \begin{array}{c}x+7\le 3x+5\\ 2\le 2x\end{array} \arrow[dl] \\
& 1\le x<10 &
\end{tikzcd}$$

$\sum x=1+2+\ldots+9=45$

Yanıt / The Answer is A

5.

$$\begin{tikzcd}
& -x-1<3x+7\le 2x+8 \arrow[dl] \arrow[dr] & \\
\begin{array}{c}-x-1<3x+7\\ -8<4x\end{array} \arrow[dr] & & \begin{array}{c}3x+7\le 2x+8\\ x\le 1\end{array} \arrow[dl] \\
& -2<x\le 1 &
\end{tikzcd}$$

ÇK(SS) = $(-2,\ 1]$

Yanıt / The Answer is B

6. $2x+5y=24 \Rightarrow y=\frac{24-2x}{5}$

$-3\le x<10 \Rightarrow 6\ge -2x>-20$

$30\ge 24-2x>4$

$6\ge\frac{24-2x}{5}>\frac{4}{5}$

$6\ge y>\frac{4}{5}$

$y\in Z \Rightarrow \sum y=1+2+\ldots+6=21$

Yanıt / The Answer is B

7. $0 \le x^2 \Rightarrow 0 < x^2 < 1$

$$\left.\begin{array}{l} 0 < x^2 + 1 \\[2ex] \dfrac{x^2+1}{x-3} < 0 \end{array}\right\} \Rightarrow x - 3 < 0$$

$\Rightarrow$ ÇK(SS) $= (-\infty, 3)$

Yanıt / The Answer is A

---

8. $\dfrac{3}{5} < \dfrac{2}{x} < \dfrac{6}{5} \Rightarrow 3 < \dfrac{10}{x} < 6$

$\dfrac{1}{3} > \dfrac{x}{10} > \dfrac{1}{6} \Rightarrow 10 > 3x > 5$

$\dfrac{10}{3} > x > \dfrac{5}{3}$

$x \in Z \Rightarrow \sum x = 2 + 3 = 5$

Yanıt / The Answer is B

---

9. $x, y, z \in Z,$

$$\left.\begin{array}{l} x + y > 4 \\ x + z < 5 \\ y + z > 3 \end{array}\right\} \Rightarrow \begin{array}{r} x + y > 4 \\ -x - z > -5 \\ +\quad y + z > 3 \\ \hline 2y > 2 \\ y > 1 \end{array}$$

$y \in Z,\ y > 1 \Rightarrow \min(y) = 2$

Yanıt / The Answer is C

10.
$$\left.\begin{array}{l} x, y \in Z \\ \min(x) = -2 \\ \max(y) = 4 \end{array}\right\} \Rightarrow \min(2x - y) = -4 - 4 = -8$$

Yanıt / The Answer is B

---

11. $-3 < x < 4 \Rightarrow -6 < 2x < 8$

$1 < y < 5 \Rightarrow -5 < -y < -1$

$-11 < 2x - y < 7$

$(2x - y) \in Z \Rightarrow \min(2x - y) = -10$

Yanıt / The Answer is A

---

12. $2x + 3 \le 1$

$2x \le -2$

$x \le -1$ ……… **(1)**

$5 < 3x + 11$

$-6 < 3x$

$-2 < x$ ……… **(2)**

1 ve (and) 2

$-2 < x \le -1$

$\Rightarrow$ ÇK(SS) $= (-2, -1]$

Yanıt / The Answer is B

1. $x \in Z$,

$2x + 1 < x + 8 < 3x + 2 \Rightarrow \sum x = ?$

Yanıt / The Answer is: **15**

2. $x \in Z$,

$x - 5 \le 2x + 6 < x + 7 \Rightarrow \sum x = ?$

Yanıt / The Answer is: **–66**

3. $x \in Z$,

$$\frac{1}{2} - \frac{3}{x+2} \le \frac{1}{4} \Rightarrow \sum x = ?$$

Yanıt / The Answer is: **54**

4. $x < 0$,

$$\frac{3x+8}{x} < 1 \Rightarrow \text{ÇK(SS)} = ?$$

Yanıt / The Answer is: **(–4, 0)**

5. $$\frac{3-x}{2} - \frac{x+4}{3} \le 1 \Rightarrow \text{ÇK(SS)} = ?$$

Yanıt / The Answer is: **[–1, ∞)**

6. $x \in Z$,

$$\frac{x-5}{2} - \frac{2x+4}{4} < x - \frac{2x-1}{3} \Rightarrow \min(x) = ?$$

Yanıt / The Answer is: **–11**

7. $x \in Z$,

$$\frac{2}{3}-\frac{x}{5} \geq \frac{x}{2}-\frac{4}{5} \Rightarrow \mathbf{max(x)=?}$$

Yanıt / The Answer is: **2**

8. $x \in Z$,

$$\frac{x-3}{5}-4 > \frac{x}{6} \Rightarrow \mathbf{min(x)=?}$$

Yanıt / The Answer is: **139**

9. $x \in Z$,

$$\left.\begin{aligned} -3 < 2y+1 < 4 \\ 3x-y=5 \end{aligned}\right\} \Rightarrow \mathbf{x=?}$$

Yanıt / The Answer is: **2**

10. $x \in Z$,

$$-5 < \frac{4x-3}{7} < 8 \Rightarrow \mathbf{min(x)+max(x)=?}$$

Yanıt / The Answer is: **7**

11. $x, y \in Z$,

$$\left.\begin{aligned} -2 < x \leq 3 \\ -6 < y \leq 4 \end{aligned}\right\} \Rightarrow \mathbf{max(2x+y)=?}$$

Yanıt / The Answer is: **10**

12. $(x \cdot y) \in Z$,

$$\left.\begin{aligned} -5 < x < 4 \\ -6 < y < 6 \end{aligned}\right\} \Rightarrow \mathbf{min(x \cdot y)\ +\ max(x \cdot y)=?}$$

Yanıt / The Answer is: **0**

1. $x \in Z^-$,

$3x - 1 < 4x + 8 \Rightarrow$ **max(x) + min(x) = ?**

A) –9 B) –8 C) –7 D) –6 E) –5

2. $x \in Z$,

$\frac{4}{5} < \frac{x}{10} \leq \frac{6}{5} \Rightarrow \sum x = ?$

A) 36 B) 38 C) 42 D) 44 E) 46

3. $x \in Z$,

$\frac{2x-5}{4} - \frac{x+2}{8} < \frac{3x+1}{2} \Rightarrow \mathbf{min(x) = ?}$

A) –2 B) –1 C) 0 D) 1 E) 2

4. $x \in Z^+$,

$\frac{8}{2x+5} > \frac{1}{2} \Rightarrow \sum x = ?$

A) 12 B) 13 C) 14 D) 15 E) 16

5. $x \in Z$,

$3x - 7 < x - 9 \leq 2x - 3 \Rightarrow \sum x = ?$

A) –22 B) –21 C) –20 D) –19 E) –18

6. $b \in Z$,

$$\left.\begin{array}{l} a+b<5 \\ b+c<-2 \\ a+c>3 \end{array}\right\} \Rightarrow \mathbf{max(b) = ?}$$

A) –3 B) –2 C) –1 D) 0 E) 1

7. $y \in Z$,

$-3 < x < 5,\ 2x - y + 4 = 0 \Rightarrow \sum y = ?$

A) 70 B) 75 C) 80

D) 85 E) 90

8. $a, b, c \in R^+$,

$$\left.\begin{array}{l} a \cdot b = 4 \\ b \cdot c = 2 \\ a \cdot c = 3 \end{array}\right\} \Rightarrow \ ? < ? < ?$$

A) $b < a < c$ B) $c < b < a$ C) $a < b < c$

D) $c < a < b$ E) $b < c < a$

9. $a, b \in Z$,

$$\left.\begin{array}{l} -3 < a \le 5 \\ 4 \le b < 8 \end{array}\right\} \Rightarrow \min(3b - 2a) = ?$$

A) –3 B) 2 C) 6

D) 10 E) 15

10. $(3x - 2y) \in Z$,

$$\left.\begin{array}{l} -2 < x \le 5 \\ -3 < y < 4 \end{array}\right\} \Rightarrow \max(3x - 2y) = ?$$

A) 19 B) 20 C) 21

D) 22 E) 23

11. $a, b \in R$, $(2a - 3b) \in Z$,

$$\left.\begin{array}{l} -1 \le a < 5 \\ 3 < b < 7 \end{array}\right\} \Rightarrow \sum (2a - 3b) = ?$$

A) –264 B) –260 C) –255

D) –253 E) –250

12. $a, b \in R$,

$a^2 + b^2 \in Z$

$$\left.\begin{array}{l} -3 < a \le 4 \\ 2 < b < 5 \end{array}\right\} \Rightarrow \max(a^2 + b^2) = ?$$

A) 30 B) 31 C) 34

D) 37 E) 40

YANITLAR / ANSWERS

1. A	2. C	3. B	4. D	5. C	6. C	7. E	8. B
9. B	10. B	11. D	12. E				

1. $x \in Z^+$,

$$\frac{2}{x+2} > \frac{4}{9} \Rightarrow \sum x = ?$$

A) 2 B) 3 C) 4 D) 5 E) 6

2. $(x + y + z) \in Z$,

$$\left.\begin{matrix} 3x+2y>-10 \\ 2y+z>-5 \\ x+3z>-9 \end{matrix}\right\} \Rightarrow \min(x+y+z)=?$$

A) –8 B) –7 C) –6 D) –5 E) –4

3.

$$\left.\begin{matrix} -3 \le x < 5 \\ 2 < y \le 4 \end{matrix}\right\} \Rightarrow 2x-y \in (?,?)$$

A) [–10, 8) B) [–8, 5) C) [–4, 4] D) (–2, 10) E) (–1, 5)

4. $y \in Z$,

$$\left.\begin{matrix} -3 < x \le 4 \\ 3x-y=1 \end{matrix}\right\} \Rightarrow \sum y = ?$$

A) 17 B) 18 C) 19 D) 20 E) 21

5. $x, y \in Z$,

$$\left.\begin{matrix} -4 < x \le 5 \\ -3 < y \le 8 \end{matrix}\right\} \Rightarrow \min(x \cdot y)+\max(x \cdot y)=?$$

A) 9 B) 11 C) 15 D) 16 E) 18

6. $x, y \in Z$,

$$\left.\begin{matrix} -3 < x < 2 \\ 1 < y < 7 \end{matrix}\right\} \Rightarrow \max(2x-3y)=?$$

A) –8 B) –7 C) –6 D) –5 E) –4

7. $(x^2 + 5) \in Z$,

$-3 < x < 2 \Rightarrow \max(x^2 + 5) + \min(x^2 + 5) = ?$

A) 16 B) 17 C) 18 D) 19 E) 20

8. $(a^3 + b^2) \in Z$,

$$\left.\begin{array}{l} -2 < a < 3 \\ -3 < b < 1 \end{array}\right\} \Rightarrow \max(a^3 + b^2) = ?$$

A) 35 B) 38 C) 40 D) 42 E) 44

9. $x, y, z \in R$,

$$\left.\begin{array}{l} x^2 \cdot y^3 < 0 \\ z^3 \cdot x^4 > 0 \\ 5z = 4x \end{array}\right\} \Rightarrow ? < ? < ?$$

A) $x < y < z$ B) $y < z < x$ C) $z < x < y$ D) $y < x < z$ E) $x < z < y$

10.

$$\left.\begin{array}{l} b > 0 \\ a \cdot b < 0 \\ a^3 > a \end{array}\right\} \Rightarrow a \in (?,?)$$

A) (–4, –3) B) (–3, –2) C) (–2, ,1) D) (–1, 0) E) (0, 1)

11. $x > y > 5$

$$\left.\begin{array}{l} a = \dfrac{x}{y} \\ b = \dfrac{5}{y} \\ c = \dfrac{x}{5} \end{array}\right\} \Rightarrow ? < ? < ?$$

A) $b < c < a$ B) $a < b < c$ C) $c < a < b$ D) $c < b < a$ E) $b < a < c$

12. $x, y, z \in Z$,

$$\left.\begin{array}{l} 1 \le x < 6 \\ 1 \le y \le 2 \\ 1 < z \le 6 \end{array}\right\} \Rightarrow \min\left(\frac{10}{x} - \frac{2}{y} + z\right) = ?$$

A) 0 B) 1 C) 2 D) 3 E) 4

YANITLAR / ANSWERS							
1. B	2. D	3. A	4. E	5. D	6. E	7. C	8. A
9. B	10. D	11. E	12. C				

1. $x > 3 \Rightarrow |3 - x| - |x - 3| - x = ?$

A) 6 B) 3 C) –3

D) x E) –x

2. $2 < x < 4,$

$\sqrt{x^2 - 32x + 256} = 4|x| + 3 \Rightarrow x = ?$

A) $\frac{9}{5}$ B) $\frac{11}{5}$ C) $\frac{13}{5}$

D) $\frac{17}{5}$ E) $\frac{19}{5}$

3. $a < 0,$

$|3a - |a - 3|| = 7 \Rightarrow a = ?$

A) –1 B) –2 C) –3

D) –4 E) –5

4. $-2 < x < \frac{3}{2} \Rightarrow$

$|x + 2| - |2x - 3| + |x - 5| = ?$

A) x – 3 B) 2x – 5 C) 2x + 1

D) 2x + 4 E) 2x + 7

5. $\min(|3x - 4y|) \Rightarrow \frac{2x + y}{x - y} = ?$

A) 7 B) 9 C) 11

D) 13 E) 15

6. $|2x - 7| + 8 = 5 \Rightarrow$ **ÇK(SS) = ?**

A) ∅ B) {3} C) {2, 5}

D) {5} E) R

7. $||x+2|-5| = 6 \Rightarrow \sum x = ?$

A) –3 B) –4 C) –5 D) –6 E) –7

8. $|2x-1| = x+1 \Rightarrow \sum x = ?$

A) –1 B) 0 C) 1 D) 2 E) 3

9. $y \in Z$,

$|x+2| < 4,\ 2x - y = 5 \Rightarrow \sum y = ?$

A) –133 B) –134 C) –135 D) –136 E) –137

10. $x \in Z$,

$$\frac{3}{|x-2|} < \frac{1}{2} \Rightarrow \sum x = ?$$

A) –27 B) –26 C) –25 D) –24 E) –23

11. $-5 < |7x-3| \Rightarrow$ **ÇK(SS) = ?**

A) $\varnothing$ B) $\left(-\frac{2}{7}, \infty\right)$ C) $\left(\frac{3}{7}, \infty\right)$ D) $\left[\frac{5}{7}, \infty\right)$ E) R

12.
$$\left.\begin{array}{l} |x| > x \\ y > |z| \\ x \cdot z > x^2 \end{array}\right\} \Rightarrow ? < ? < ?$$

A) $z < x < 0 < y$ B) $x < z < y < 0$

C) $y < x < 0 < z$ D) $0 < x < y < z$

E) $y < 0 < x < z$

YANITLAR / ANSWERS

1. E	2. C	3. A	4. D	5. C	6. A	7. B	8. D
9. C	10. B	11. E	12. A				

1. $x > 3 \Rightarrow 3 - x < 0$

$x > 3 \Rightarrow x - 3 > 0$

$$\begin{aligned}|3 - x| - |x - 3| - x &= x - 3 - (x - 3) - x\\ &= x - 3 - x + 3 - x\\ &= -x\end{aligned}$$

Yanıt / The Answer is E

---

2. $\sqrt{x^2 - 32x + 256} = 4 \cdot |x| + 3$

$\sqrt{(x-16)^2} = 4 \cdot |x| + 3$

$|x - 16| = 4 \cdot |x| + 3$

$2 < x < 4 \Rightarrow 16 - x = 4x + 3$

$13 = 5x$

$x = \dfrac{13}{5}$

Yanıt / The Answer is C

---

3. $|3a - |a - 3|| = 7$

$a < 0 \Rightarrow a - 3 < 0$

$|3a - (3 - a)| = 7$

$|3a - 3 + a| = 7$

$a < 0 \Rightarrow 4a - 3 < 0$

$3 - 4a = 7$

$4a = -4$

$a = -1$

Yanıt / The Answer is A

---

4. $-2 < x < \dfrac{3}{2} \Rightarrow x + 2 > 0,\ 2x - 3 < 0,\ x - 5 < 0$

$$\begin{aligned}|x + 2| - |2x - 3| + |x - 5| &= x + 2 - (3 - 2x) + 5 - x\\ &= x + 2 - 3 + 2x + 5 - x\\ &= 2x + 4\end{aligned}$$

Yanıt / The Answer is D

---

5. $\min(|3x - 4y|) = 0 \Rightarrow 3x - 4y = 0$

$3x = 4y$

$$3\underset{\substack{\downarrow\\ 4k}}{x} = 4\underset{\substack{\downarrow\\ 3k}}{y} \Rightarrow \frac{2x + y}{x - y} = \frac{2\cdot(4k) + 3k}{4k - 3k} = 11$$

Yanıt / The Answer is C

---

6. $|2x - 7| + 8 = 5$

$|2x - 7| = -3 \Rightarrow$ ÇK(SS) $= \varnothing$

Yanıt / The Answer is A

7. $||x+2|-5| = 6$

$|x+2|-5 = 6$

$|x+2| = 11$

$x+2 = 11$ $\quad$ $x+2 = -11$

$x = 9$ $\quad$ $x = -13$

$ÇK(SS) = \{-13, 9\}$

$|x+2|-5 = -6$

$|x+2| = -1$

$ÇK(SS) = \varnothing$

$$\Rightarrow \sum x = -13 + 9 = -4$$

Yanıt / The Answer is B

8. $|2x-1| = x+1$

$2x-1 = x+1$

$2x - x = 1 + 1$

$x = 2$

$2x-1 = -x-1$

$3x = 0$

$x = 0$

$$\Rightarrow \sum x = 2 + 0 = 2$$

Yanıt / The Answer is D

9. $|x+2| < 4 \Rightarrow -4 < x+2 < 4$

$-6 < x < 2$

$2x - y = 5 \Rightarrow y = 2x - 5$

$y = 2x - 5 \Rightarrow -17 < 2x - 5 < -1$

$-17 < y < -1$

$y \in Z \Rightarrow \sum y = -135$

Yanıt / The Answer is C

10. $\dfrac{3}{|x-2|} < \dfrac{1}{2} \Rightarrow \dfrac{|x-2|}{3} > 2$

$|x-2| > 6$

$|x-2| > 6$

$x - 2 > 6$ $\quad$ $x - 2 < -6$

$x > 8$ $\quad$ $x < -4$

$$x \in Z \Rightarrow \sum x = -26$$

Yanıt / The Answer is B

11. $-5 < |7x-3|$

$|a| \geq 0 \Rightarrow 0 \leq |7x-3|$

$0 \leq |7x-3| \Rightarrow -5 < |7x-3|$

$\Rightarrow ÇK(SS) = R$

Yanıt / The Answer is E

12. $|x| > x \Rightarrow x < 0$

$y > |z| \Rightarrow y > 0$

$$\left.\begin{matrix} x \cdot z > x^2 \\ x < 0 \end{matrix}\right\} \Rightarrow z < 0,\ z < x$$

$\Rightarrow z < x < 0 < y$

Yanıt / The Answer is A

1. $-2 < x < 5 \Rightarrow |x + 2| + |x - 5| = ?$

Yanıt / The Answer is: **7**

2. $3 < x \Rightarrow |2x + |3 - x|| = ?$

Yanıt / The Answer is: **3x – 3**

3. $a < 0,\ 0 < b \Rightarrow$

$$\sqrt{a^2} + \sqrt[3]{-b^3} - |b - a| = ?$$

Yanıt / The Answer is: **–2b**

4. $a < 0 < b < c \Rightarrow$

$$\frac{|b-c|+|b-a|}{|a|+|c|} = ?$$

Yanıt / The Answer is: **1**

5. $x \in Z$,

$$\frac{|x-3|}{4} < 2 \Rightarrow \sum x = ?$$

Yanıt / The Answer is: **45**

6. $x + 4 - |x - 4| = 0 \Rightarrow x = ?$

Yanıt / The Answer is: **0**

7. $\left.\begin{array}{l} a<0<b \\ |a|<b \end{array}\right\} \Rightarrow \mathbf{|b-a|+|b+a|-2|b|=?}$

Yanıt / The Answer is: **0**

8. $y \in Z,$

$1 < |2x-1| < 2$

$3x + y = 5 \quad \Rightarrow \sum \mathbf{y = ?}$

Yanıt / The Answer is: **7**

9. $|5 - |x - 3|| = 7 \Rightarrow \sum \mathbf{x = ?}$

Yanıt / The Answer is: **6**

10. $||3x - 1| + 7| = 10 \Rightarrow \sum \mathbf{x = ?}$

Yanıt / The Answer is: $\mathbf{\frac{2}{3}}$

11. $|3x + 7| = 2x + 13 \Rightarrow \sum \mathbf{x = ?}$

Yanıt / The Answer is: **2**

12. $x \in Z,$

$\left|\frac{3}{x+2}\right| \geq \frac{1}{2} \quad \Rightarrow \sum \mathbf{x = ?}$

Yanıt / The Answer is: **–24**

1. $3 < x < 7 \Rightarrow |x - 10| + |x + 1| = ?$

A) 3

B) 5

C) 7

D) 9

E) 11

2. $3 < x < 6 \Rightarrow$

$$\sqrt{x^2 - 6x + 9} + \sqrt{x^2 - 14x + 49} = ?$$

A) –10

B) –4

C) 1

D) 4

E) 10

3. $1 < x < 5$,

$2|x - 1| + |11 - 2x| = 4 - y \Rightarrow y = ?$

A) –9

B) –7

C) –5

D) –3

E) –1

4. $a < 0 < b \Rightarrow$

$$\frac{|a|}{a} + \frac{|b|}{b} - \frac{|a-b|}{b-a} = ?$$

A) 2

B) 1

C) 0

D) –1

E) –2

5. $x < y < z$

$|x - y| - |y - z| + |x - z| = 8 \Rightarrow x - y = ?$

A) –4

B) –2

C) 0

D) 2

E) 4

6. $|3x - 5y| + |y - 6| = 0 \Rightarrow x + y = ?$

A) 12

B) 15

C) 16

D) 18

E) 21

7. $3|x+1|-5=|2x+2| \Rightarrow \sum x=?$

A) –4

B) –3

C) –2

D) –1

E) 0

8. $x \in Z,$

$\frac{|5x-2|-7}{|x-3|+4} \le 0 \Rightarrow \sum x=?$

A) –2

B) –1

C) 0

D) 1

E) 2

9. $||2x-3|-5|=9 \Rightarrow \sum x=?$

A) –3

B) –1

C) 1

D) 3

E) 5

10. $A=\frac{30}{|x+1|+|x+2|} \Rightarrow \max(A)=?$

A) 5

B) 6

C) 10

D) 15

E) 30

11. $x \in Z,$

$3<|2x+1|<7 \Rightarrow \sum x=?$

A) –1

B) 0

C) 1

D) 2

E) 3

12. $a, b \in Z,$

$$\left.\begin{array}{l}5<|a|<8\\ 2<|b|\le 3\end{array}\right\} \Rightarrow \max(a-b)=?$$

A) 1

B) 4

C) 5

D) 8

E) 10

YANITLAR / ANSWERS

1. E	2. D	3. C	4. D	5. A	6. C	7. C	8. C
9. D	10. E	11. A	12. E				

1. $y \in Z$,

$|x-2| < 3$

$3x + 2y = 15 \Rightarrow$ **min(y) = ?**

A) –1

B) 1

C) 3

D) 4

E) 6

2. $|x^2-9| - |x-3| = 0 \Rightarrow \sum x = ?$

A) 3

B) 1

C) 0

D) –1

E) –3

3. $|x| = -x \Rightarrow$

$$\frac{|-x+2|x||}{|x|} = ?$$

A) –3

B) –2

C) 1

D) 2

E) 3

4. $x \in Z$,

$|x-3| + |3-x| < 10 \Rightarrow$ **max(x) = ?**

A) 3

B) 6

C) 7

D) 9

E) 10

5. $$\left.\begin{array}{l}|x+4| = x+4\\ |x-3| = 3-x\end{array}\right\} \Rightarrow \text{ÇK(SS)} = ?$$

A) [–4, –3)

B) [–3, 3]

C) [–4, 4]

D) [–4, 3)

E) [–3, 4]

6. $x < |x| = -y$

$|x+y| + |x-y| + |x \cdot y| = 8 \Rightarrow$ **x = ?**

A) –4

B) –2

C) 0

D) 2

E) 4

7. $x \in Z$,

$||x + 1| - 5| < 1 \Rightarrow \sum x = ?$

A) –2
B) 0
C) 3
D) 4
E) 7

8. $x \in Z$,

$-16 < |x^2 - 1| < 14 \Rightarrow \sum x = ?$

A) –4
B) –1
C) 0
D) 2
E) 3

9. $|x - 5| + |5 - x| = |3x + 5| \Rightarrow \sum x = ?$

A) –14
B) –9
C) –6
D) –4
E) –1

10. $\left|-3 + \frac{|x|}{x}\right| + 2 = y \Rightarrow \sum y = ?$

A) 7
B) 8
C) 9
D) 10
E) 11

11. $|3x - 6| + |x - 2| = 16 \Rightarrow \sum x = ?$

A) 4
B) 6
C) 8
D) 10
E) 12

12. $\min(|3x - 6| - 12) \Rightarrow |x^2 - 3x| = ?$

A) 0
B) 1
C) 2
D) 3
E) 4

YANITLAR / ANSWERS

1. B 2. E 3. E 4. C 5. D 6. B 7. A 8. C
9. A 10. D 11. A 12. C

1. $\left.\begin{array}{l} |x| > x \\ |y| < z \\ xy > x^2 \end{array}\right\} \Rightarrow \mathbf{? < ? < ?}$

A) $x < y < z < 0$

B) $y < x < 0 < z$

C) $x < 0 < z < y$

D) $x < z < 0 < y$

E) $z < 0 < x < y$

2. $|x - 3| = |3x - 5| \Rightarrow \mathbf{\sum x = ?}$

A) -4

B) -2

C) 0

D) 1

E) 3

3. $A = |x - 2| + |x + 3| \Rightarrow \mathbf{min(A) = ?}$

A) 1

B) 2

C) 3

D) 4

E) 5

4. $1 - 2|3x - 4| = 5 \Rightarrow$ **ÇK(SS) = ?**

A) $\varnothing$

B) $\{1, 2\}$

C) $\{1, 3\}$

D) $\{-1, 4\}$

E) $\mathbb{R}$

5. $\left.\begin{array}{l} |x+2| = x+2 \\ |x-4| = 4-x \end{array}\right\} \Rightarrow$ **ÇK(SS) = ?**

A) $[-2, 3]$

B) $[1, 5]$

C) $[-4, 2]$

D) $[-2, 4)$

E) $[2, 4)$

6. $||x + 1| - 2x| = 6 \Rightarrow \mathbf{\sum x = ?}$

A) $\frac{4}{3}$

B) $\frac{5}{3}$

C) 2

D) $\frac{8}{3}$

E) $\frac{14}{3}$

7. $x^2 - 2|x| - 15 = 0 \Rightarrow \prod x = ?$

A) –25

B) –15

C) –9

D) 15

E) 25

8. $x < 0 < y$

$$\Rightarrow \frac{|x-2y|-|y-x|-|y|}{|y|-|x|} = ?$$

A) –x

B) 2y

C) –2

D) 1

E) 0

9. $|2x - |x|| = 2x + 10 \Rightarrow \sum x = ?$

A) –4

B) –3

C) –2

D) –1

E) 0

10. $x \in Z$,

$||4x + 3| + |5 - x|| = 7 \Rightarrow x = ?$

A) – 2

B) – 1

C) 0

D) 2

E) 9

11. $|x - 2| \le |x + 1| \Rightarrow$ **ÇK(SS) = ?**

A) $\left[\frac{1}{2}, \infty\right)$

B) $\left[\frac{3}{2}, \infty\right)$

C) $\left[\frac{7}{2}, \infty\right)$

D) $\left[\frac{9}{2}, \infty\right)$

E) $\left[\frac{11}{2}, \infty\right)$

12. $x \cdot |x| \le 2 \Rightarrow$ **ÇK (SS) = ?**

A) $(-\infty, -2)$

B) $(\sqrt{2}, \infty)$

C) $(-\infty, -\sqrt{2})$

D) $(0, \sqrt{2})$

E) $(-\infty, \sqrt{2})$

YANITLAR / ANSWERS

1. B	2. E	3. E	4. A	5. D	6. E	7. A	8. E
9. C	10. B	11. A	12. E				

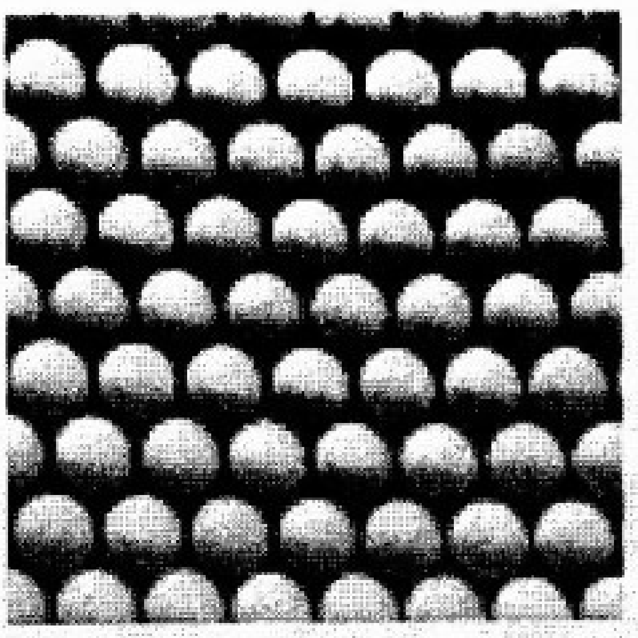
ÜNİTE 5
UNIT

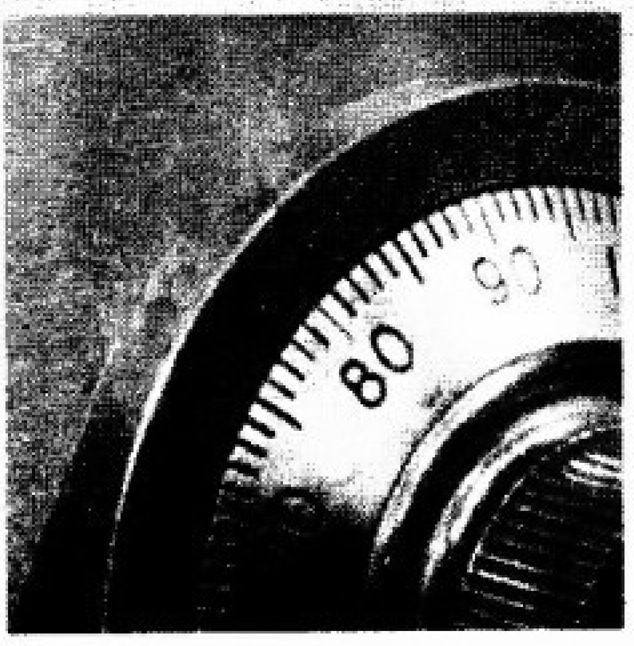
Bu ünitede; kümeler, fonksiyonlar, işlem ve modüler aritmetik kavramları ayrıntılı anlatılmıştır.

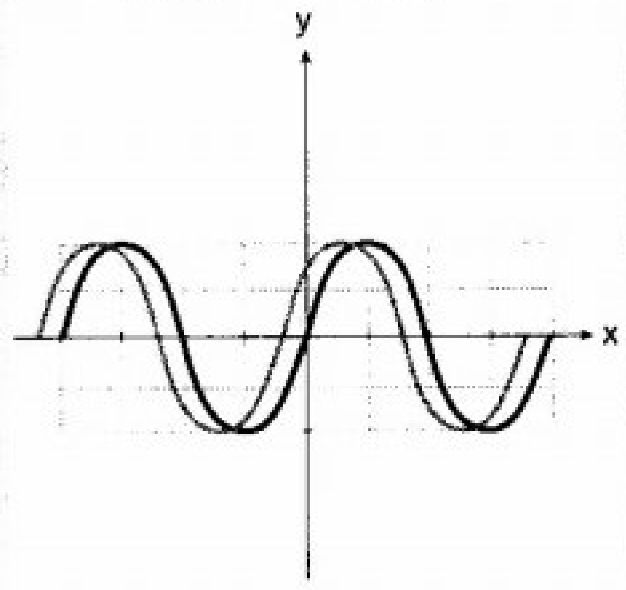
Bu ünite, 78 çözümlü örnek, 46 alıştırma, 96 test sorusu içermektedir.

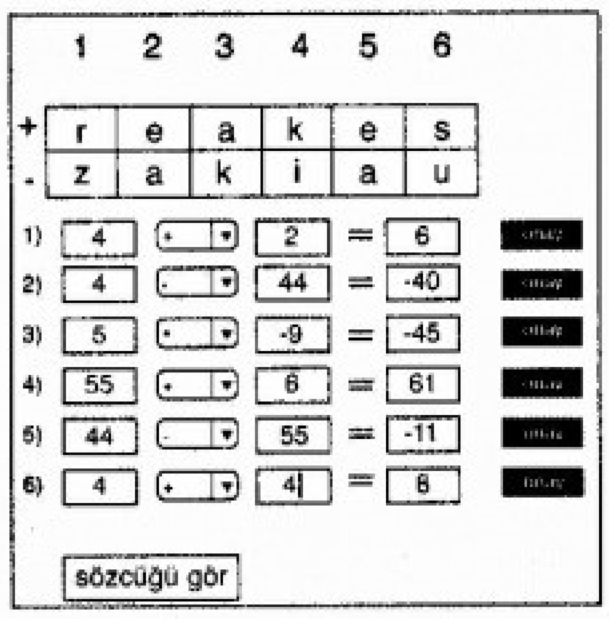
In this unit, sets, functions, operation and modular systems are explained in detailed.

This unit includes; ' 96 test questions.









	1	2	3	4	5	6
+	r	e	a	k	e	s
-	z	a	k	i	a	u

1) 4 + 2 = 6
2) 4 - 44 = -40
3) 5 • -9 = -45
4) 55 + 6 = 61
5) 44 - 55 = -11
6) 4 + 4 = 8

- **PERMÜTASYON, KOMBİNASYON VE OLASILIK**
  PERMUTATIONS, COMBINATIONS AND PROBABILITY . . . . 239 – 268
- **KÜMELER / *SETS*** . . . . 269 – 288
- **FONKSİYONLAR / *FUNCTIONS*** . . . . 289 – 318
- **İŞLEM ve MODÜLER ARİTMETİK**
  OPERATION and MODULAR SYSTEMS . . . . 319 – 330

1. $\binom{n}{2} = \frac{P(n,4)}{24} \Rightarrow n = ?$

A) 4

B) 5

C) 6

D) 7

E) 8

2. $A = \binom{20}{n}$, max(A), $\binom{n}{a+2} = \binom{n}{4a-7} \Rightarrow \sum a = ?$

A) 2

B) 3

C) 4

D) 5

E) 6

3. **Mehran ve Katya'nın bulunduğu 10 kişilik bir grupta Mehran ve Katya'nın farklı gruplarda olması koşuluyla 5 er kişilik 2 grup kaç farklı şekilde oluşturulabilir?**

From among a group of 10 people that includes Mehran and Katya, 2 groups of 5 people will be chosen. In how many different ways this choise can be made if Mehran and Katya must be in different groups?

A) 70

B) 120

C) 140

D) 180

E) 210

4. **Bir sınıfın öğrencileri arasından 6 kişilik bir basketbol takımı oluşturulacaktır. Sınıfın 12 uygun öğrencisi arasından belirli iki öğrenci, oluşacak takımda birlikte bulunmayacağına göre, bu takım kaç değişik biçimde oluşturulabilir?**

A basketball team of 6 people will be constituted from among the students in a classroom. In how many different ways the team can be constituted if certain 2 students, will not participate in the team?

A) 210

B) 420

C) 630

D) 704

E) 714

5. **6 kız, 3 erkek arasından 2'si kız 1'i erkek olması koşuluyla 3 kişilik bir grup kaç farklı şekilde seçilebilir?**

In how many different ways a group of 3 people that consists of 2 girls and 1 boy be constituted from among 6 girls and 3 boys?

A) 25

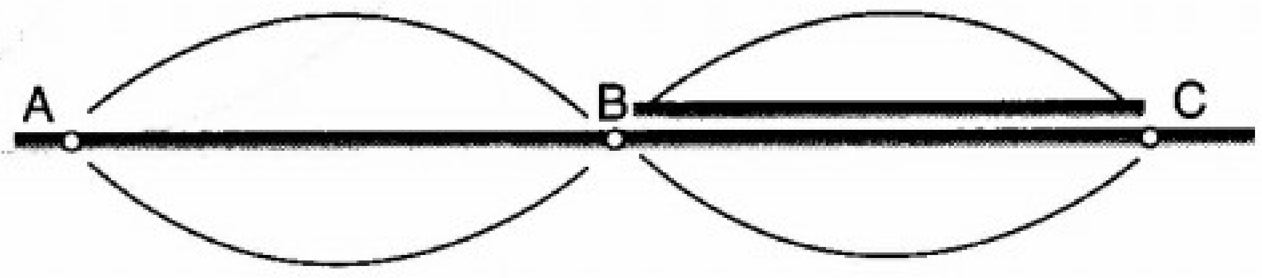
B) 30

C) 35

D) 40

E) 45

6.



Şekilde A ve B noktaları arasında 3, B ve C noktaları arasında 4 farklı yol vardır. Buna göre bir kişi A ile C arasında kaç farklı gidiş-dönüş yapabilir?

There are 3 different roads between Point A and Point B and 4 different roads between Point B and Point C. According to that, how many different round-trips can be made between A and C?

A) 7 B) 24 C) 49

D) 64 E) 144

7. **Üç basamaklı, kaç tek doğal sayı yazılabilir?**

How many three digit odd numbers can be written?

A) 270
B) 280
C) 300
D) 370
E) 450

8. **6 kişiden seçilen 4 kişi yuvarlak bir masa etrafında kaç farklı şekilde oturabilir?**

In how many different ways can 4 people that are chosen from among 6 people be seated around a table?

A) 40
B) 46
C) 50
D) 60
E) 90

9. **Bir kutudaki siyah kalemlerin sayısı, kırmızı kalemlerin sayısından 4 fazladır. Kutudan rastgele seçilen bir kalemin siyah olma olasılığı 4/7 olduğuna göre, bu kutuda toplam kaç kalem vardır?**

In a box, the number of black pens exceeds the number of red pens by 4. If the probability of getting a black pen when a pen is chosen randomly, which of the following is the number of pens in this box?

A) 28
B) 26
C) 24
D) 22
E) 20

10. **Bir grupta 5 kız, 6 erkek öğrenci vardır. Buna göre, gruptan seçilen 3 öğrencinin de kız olma olasılığı kaçtır?**

There are 5 girls and 6 boys in a group. According to that, what is the probability of choosing 3 girls from among the group randomly?

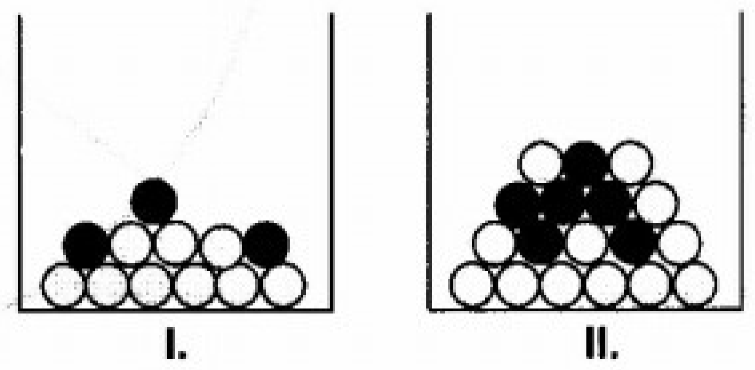
A) $\frac{2}{121}$
B) $\frac{1}{22}$
C) $\frac{2}{33}$
D) $\frac{4}{121}$
E) $\frac{3}{11}$

11. **A, A, H, T, Y harfleri aynı özellikteki 5 karta yazılarak bir torbaya atılıyor. Kartlar art arda rastgele çekilerek soldan sağa dizildiğinde HATAY sözcüğünü oluşturma olasılığı kaçtır?**

The letters of A, A, H, T, Y are written on the some sized and shaped cards and put in a pouch. What is the probability of forming the word HATAY when the cards have picked adjacently and ordered from left to right?

A) $\frac{1}{5}$
B) $\frac{1}{25}$
C) $\frac{1}{30}$
D) $\frac{1}{40}$
E) $\frac{1}{60}$

12.



Şekildeki I. kutuda 3 mavi, 9 yeşil top, II. kutuda is 6 mavi, 12 yeşil top vardır. Buna göre, kutulardan rastgele çekilen 1'er topun aynı renkte olma olasılığı kaçtır?

In the first box, there are 3 blue and 12 green balls and in the second box, there are 6 blue and 12 green balls. According to that, what is the probability of picking the same cobored balls from each of the pouches?

A) 28
B) 26
C) 24
D) 22
E) 20

YANITLAR / ANSWERS

1. C	**2. B**	**3. C**	**4. E**	**5. E**	**6. E**	**7. E**	**8. E**
9. A	**10. C**	**11. E**	**12. A**				

1. $\dfrac{n!}{(n-2)!\cdot 2!}=\dfrac{n!}{(n-4)!\cdot 24}$

$\Rightarrow 2\cdot(n-2)! = 24\cdot(n-4)!$

$2\cdot(n-2)\cdot(n-3)\cdot(n-4)! = 24\cdot(n-4)!$

$2\cdot(n-2)\cdot(n-3) = 24$

$n = 6$

Yanıt / The Answer is C

---

2. $A=\binom{20}{n} \Rightarrow \max(A) = n = 10$

$\binom{10}{a+2}=\binom{10}{4a-7} \Rightarrow$

$a + 2 = 4a - 7$ veya(or) $a + 2 + 4a - 7 = 10$

$a + 2 = 4a - 7$ $\qquad 5a - 5 = 10$

$3a = 9$ $\qquad 5a = 15$

$a = 3$ $\qquad a = 3$

$\Rightarrow a = 3$

Yanıt / The Answer is B

---

3. 1. grupta Mehran ile 4 kişi bulunacak, geri kalanlar ise Katya ile birlikte ikinci grubu oluşturacaktır.
Mehran ve Katya'nın yerdeğiştirmesi göz önüne alındığında,

$2\cdot C(8,4)=2\cdot\dfrac{8!}{(8-4)!(4!)}=2\cdot 70=140$

farklı şekilde grup oluşturulabilir.

In the first group; there will be 4 people including Mehran, and the rest will constitute the second group including Katya.

$2\cdot C(8,4)=2\cdot\dfrac{8!}{(8-4)!(4!)}=2\cdot 70=140$

is the number of groups that can be formed ,when the circumstance of switching places of Mehran and Katya is considered.

Yanıt / The answer is C

4. Takımda bulunan iki öğrenci A ve B ise, 6 kişi kalan 10 kişi arasından seçilir. Böylece

$C(10,\ 6)=\dfrac{10\cdot 9\cdot 8\cdot 7}{24}=210$ değişik takım oluşturulur.

A katılır B katılmaz veya B katılır A katılmaz.
Bu iki durumda da takıma girecek 1 kişi ile, takıma girmeyecek 1 kişi bellidir. 5 kişi kalan 10 kişi arasından seçilecektir.

$C(10,\ 5)=2\cdot\dfrac{10\cdot 9\cdot 8\cdot 7\cdot 6}{120}=2\cdot\dfrac{9\cdot 8\cdot 7}{2}=72\cdot 7=504$

O halde, oluşturulacak değişik takım sayısı, toplama ilkesine göre, 210 + 504 = 714 tür.

6 people will be chosen from among 10 people because 2 people in the team is already considered as A and B. According to that;

$C(10,\ 6)=\dfrac{10\cdot 9\cdot 8\cdot 7}{24}=210$ *is the number of teams that can be formed.*

If we consider that when A is in the team B will not participate and when B is in the team A wil not participate, then in both cases, one who will participate in the team and one who will not is certain. According to that 5 people in the team will be chosen from among 10 people.

$C(10,\ 5)=2\cdot\dfrac{10\cdot 9\cdot 8\cdot 7\cdot 6}{120}=2\cdot\dfrac{9\cdot 8\cdot 7}{2}=72\cdot 7=504$

According to the addition law, the number of teams that can be formed is 210 + 504 = 714.

Yanıt / The answer is E

---

5. 6 kızdan 2 si, $\binom{6}{2}=\dfrac{6!}{(6-2)!\cdot 2!}=15$, 3 erkekten 1 i $\binom{3}{1}=\dfrac{3!}{(3-1)!\cdot 1!}=3$ farklı şekilde seçileceğinden çarpma ilkesinden15· 3 = 45 farklı grup oluşturulabilir.

2 girls from among 6 girls can be chosen in $\binom{6}{2}=\dfrac{6!}{(6-2)!\cdot 2!}=15$ *ways and 1 boy from among 3 boys can be chosen in* $\binom{3}{1}=\dfrac{3!}{(3-1)!\cdot 1!}=3$ *ways. According to the multiplication law, 15·3 = 45 different groups can be formed.*

Yanıt / The answer is E

6. A ile B arasında 3, B ile C arasında 4 farklı yol olduğuna göre, çarpma ilkesine göre kişi; 3·4 = 12 farklı şekilde A'dan C'ye ulaşabilir. Gidiş-dönüş yapılacağına göre, 12·12 = 144 farklı gidiş-dönüş yapılabilir.

Since there are 3 different roads between A and B, and there are 4 different roads between B and C, according to the multiplication law; a person can travel from A to be in 3·4 =12 different ways. Considering the fact that this will be a round-trip, 12·12 = 144 different round-trips can be done.

Yanıt / The answer is E

7.

yüzler basamağı hundreds place	onlar basamağı tens place	birler basamağı ones place
9	10	5

{1, 3, 5, 7, 9}

$\Rightarrow 9 \cdot 10 \cdot 5 = 450$

Yanıt / The Answer is E

---

8. 6 kişiden 4 kişi $\binom{6}{4}$ yolla seçilebilir. 4 kişi yuvarlak bir masa etrafında (4 – 1)! = 3! farklı şekilde oturabileceğinden;

$$\binom{6}{4} \cdot 3! = \frac{6 \cdot 5 \cdot 4!}{2! \cdot 4!} \cdot 6 = 90$$

4 people from among 7 people can be chosen in $\binom{6}{4}$ *ways. Since 4 people be seated around a table in (4 – 1)! = 3! different ways, then the answer is*

$$\binom{6}{4} \cdot 3! = \frac{6 \cdot 5 \cdot 4!}{2! \cdot 4!} \cdot 6 = 90$$

Yanıt / The answer is E

---

9. Kırmızı kalem / *The number of red pencils* = x tane

Siyah kalem / *The number of black pencils* = x + 4 tane

Toplam kalem / *The sum of the pencils* = 2x + 4 tane

Rastgele çekilen kalemin siyah olma olasılığı

The probability of picking a black pen is

$$\frac{x+4}{2x+4} = \frac{4}{7}$$

$$7x + 28 = 8x + 16$$

$$12 = x \Rightarrow 2 \cdot 12 + 4 = 28$$

Yanıt / The answer is A

---

10. 5 kız, 6 erkekten oluşan bir grupta toplam 11 öğrenci vardır.

There are 11 students in a group that consists of 5 girls and 6 boys.

$$\frac{5}{11} \cdot \frac{4}{10} \cdot \frac{3}{9} = \frac{2}{33}$$

Yanıt / The answer is C

11.

H	A	T	A	Y
$\frac{1}{5}$	$\frac{2}{4}$	$\frac{1}{3}$	$\frac{1}{2}$	1

$$\frac{1}{5} \cdot \frac{2}{4} \cdot \frac{1}{3} \cdot \frac{1}{2} \cdot 1 = \frac{1}{60}$$

Yanıt / The answer is E

---

12. İki topun da mavi olma olasılığı

The probability of picking two blue balls is

$$\frac{3}{12} \cdot \frac{6}{18} = \frac{1}{12}$$

İki topun da yeşil olma olasılığı

The probability of picking two green balls is

$$\frac{9}{12} \cdot \frac{12}{18} = \frac{1}{2}$$

$$\Rightarrow \frac{1}{12} + \frac{1}{2} = \frac{7}{12}$$

Yanıt / The answer is A

1. **$P(7, 3) = ?$**

Yanıt / The Answer is: **210**

2. **$P(6, 4) + C(4, 2) = ?$**

Yanıt / The Answer is: **366**

3. **$C(5, 3) + P(5, 5) = ?$**

Yanıt / The Answer is: **130**

4. $C(n, 2) + C(n, 3) = 35 \Rightarrow$ **$n = ?$**

Yanıt / The Answer is: **6**

5. **$C(9, 3) - P(5, 2) = ?$**

Yanıt / The Answer is: **64**

6. $5 \cdot C(n, 3) = C(n, 4) \Rightarrow$ **$n = ?$**

Yanıt / The Answer is: **23**

7. **Anne, baba ve 4 çocuktan oluşan bir aile, çocukların bir arada olması koşuluyla, yan yana kaç farklı şekilde sıralanabilir?**

In how many different ways a family that consists of a mother, a father and 4 children may appear side by side if the children must remain together?

Yanıt / The Answer is: **144**

8. **6 mühendis ve 7 öğretmen arasından, bir mühendis ve bir doktor kaç farklı şekilde seçilebilir?**

In how many different ways an engineer and a doctor can be chosen from among 6 engineers and 7 teachers?

Yanıt / The Answer is: **42**

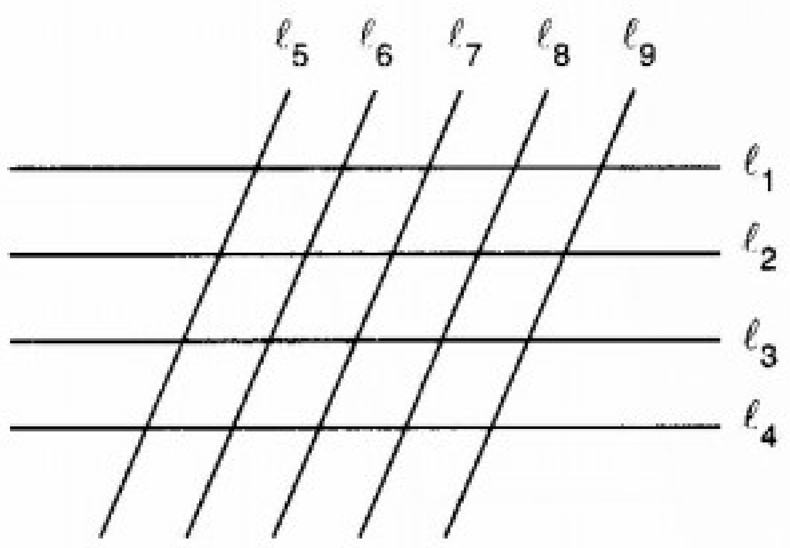
9. **A = {1, 2, 3, 4, 5, 6} kümesinin elemanlarıyla rakamları birbirinden farklı, üç basamaklı kaç farklı sayı yazılabilir?**
How many three-digit numbers such that its digits are different can be written by using the members of the set A = {1, 2, 3, 4, 5, 6} ?

Yanıt / The Answer is: **120**

10. **5 Fransız, 4 İngiliz yuvarlık bir masa etrafında Fransızlar yan yana oturmak koşuluyla kaç farklı şekilde oturabilir?**
In how many different ways can 5 French, and 4 British be seated around a table in condition of French people appearing side by side?

Yanıt / The Answer is: **4!·5!**

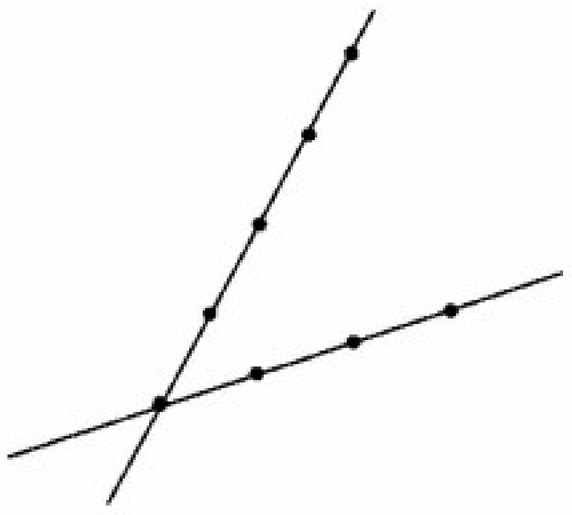
11.



$\ell_1 // \ell_2 // \ell_3 // \ell_4$ ve $\ell_5 // \ell_6 // \ell_7 // \ell_8 // \ell_9$ olduğuna göre, kaç farklı paralelkenar vardır?
If $\ell_1 // \ell_2 // \ell_3 // \ell_4$ and $\ell_5 // \ell_6 // \ell_7 // \ell_8 // \ell_9$, how many different parallelogram in the figure?

Yanıt / The Answer is: **60**

12.



Şekilde 8 noktanın üçünü köşe kabul eden kaç farklı üçgen çizilebilir?
How many different triangles can be drawn by using 3 of the 8 points in the figure as the edges of the triangle?

Yanıt / The Answer is: **42**

13. **K = {1, 2, 3, 4, 5, 6, 7, 8} kümesinin elemanlarından biri rastgele seçiliyor. Bu elemanın çift olma olasılığı kaçtır?**
What is the probability of picking an even number when a member from the set K = {1, 2, 3, 4, 5, 6, 7, 8} is picked randomly?

Yanıt / The Answer is: **1/2**

14. **1'den 100'e kadar numaralandırılmış yüz top bir torbaya yerleştiriliyor. Torbadan rastgele çekilen bir topun çift olduğu bilindiğine göre, 50'den küçük olma olasılığı kaçtır?**
100 balls that are enumerated from 1 to 100 are put in a pouch. If it is known that the number on the ball is even, what is the probability of being smaller than 50?

Yanıt / The Answer is: **12/25**

15. **Ali'nin bir matematik sorusunu çözme olasılığı 1/10 iken, Ahmet'in çözememe olasılığı 1/5'tir. Buna göre aynı soruyu Ahmet'in çözüp, Ali'nin çözememe olasılığı kaçtır?**
The probability of Ali solving a Mathematics question is 1/10 and Ahmet not solving is 1/5. According to that, what is the probability of that question is being solved by Ahmet and not by Ali?

Yanıt / The Answer is: **18/25**

16. **Yüzleri 1'den 6'ya kadar numaralandırılan farklı iki zar düz bir zemine atılıyor. Üste gelen sayılar toplamının, 6 olduğu bilindiğine göre, bu iki sayının eşit olma olasılığı kaçtır?**
Two dice are rolled at the same time. If it is known that the sum of the numbers that appears is 6, what is the probability of being equal for those numbers?

Yanıt / The Answer is: **1/5**

1. **$C(8, 2) + P(3, 2) = ?$**

A) 30

B) 32

C) 34

D) 36

E) 38

2. $P(n, 2) + C(n, 2) = 108 \Rightarrow$ **$n = ?$**

A) 5

B) 6

C) 7

D) 8

E) 9

3. $P(n, 2) + 3 \cdot C(n, 3) = 50 \Rightarrow$ **$n = ?$**

A) 3

B) 4

C) 5

D) 6

E) 7

4. $y \neq 5$,

$P(x, y) = 6! \Rightarrow$ **$x + y = ?$**

A) 8

B) 10

C) 12

D) 14

E) 16

5. $C(n, 0) + C(n, 1) + 2 \cdot C(n, 2) = 37 \Rightarrow$ **$n = ?$**

A) 5

B) 6

C) 7

D) 8

E) 9

6. $\binom{n}{0} + \binom{n}{1} + \ldots + \binom{n}{n} = 2^8 \Rightarrow$ **$n = ?$**

A) 6

B) 7

C) 8

D) 9

E) 10

7. **5 tabanında üç basamaklı kaç farklı sayı yazılabilir?**

How many different three-digit numbers can be written with the base 5?

A) 5 B) 25 C) 50 D) 75 E) 100

8. **1, 2, 3, 4 ve 5 rakamları kullanılarak rakamları birbirinden farklı iki basamaklı kaç sayı yazılabilir?**

How many different two-digit numbers such that its digits are different can be written by using the digits 1, 2, 3, 4 and 5?

A) 5
B) 10
C) 12
D) 20
E) 25

9. **METROPOL sözcüğündeki harflerin yerleri değiştirilerek anlamlı ya da anlamsız kaç sözcük yazılabilir?**

How many different meaningful or meaningless words can be written by using the letters of the word METROPOL?

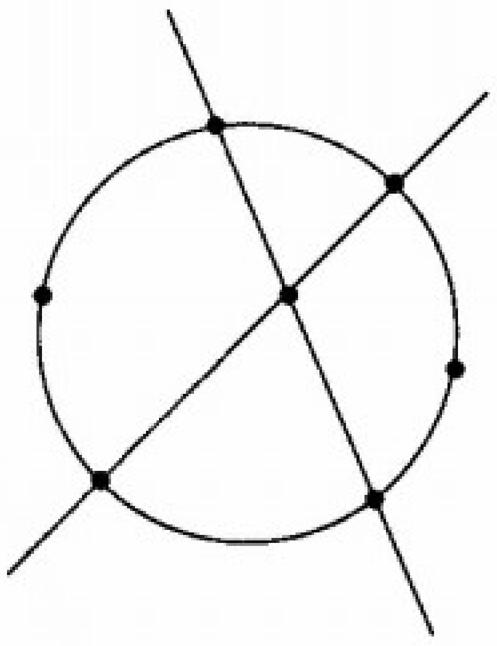
A)120 B) 6! C) $2 \cdot 6!$ D) $\frac{8!}{2}$ E) $\frac{8!}{2! \cdot 2!}$

10. **6 öğrenci içerisinden 4 kişilik bir grup ve bu grup içerisinden de bir başkan kaç farklı şekilde seçilebilir?**

In how many different ways a group of 4 people from among 6 students and a head within the group can be chosen?

A) 10 B) 24 C) 30 D) 45 E) 60

11.

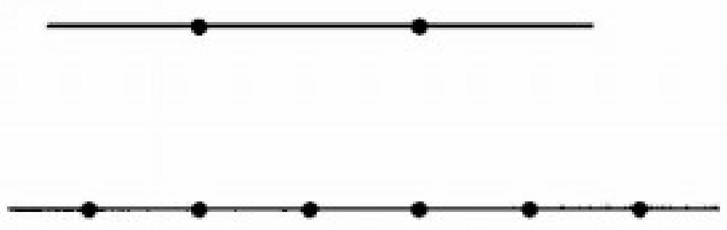


Köşeleri şekildeki 7 noktadan herhangi üçü olan kaç farklı üçgen çizilebilir?

How many different triangles can be drawn by using the points in the figure as the edges of the triangles?

A) 30 B) 33 C) 35 D) 49 E) 52

12.



Şekildeki paralel iki doğru üzerinde 8 nokta verilmiştir. Bu 8 noktadan üçü köşesi olan kaç farklı üçgen çizilebilir?

8 points located on two parallel lines given above. How many different triangles can be drawn by using those points as the edges on triangles?

A) 64 B) 36 C) 24 D) 16 E) 8

YANITLAR / ANSWERS							
1. B	2. E	3. C	4. C	5. B	6. C	7. E	8. D
9. D	10. E	11. B	12. B				

1. **Düzgün bir zar atılıyor. Üste gelen yüzünün 5'ten küçük olma olasılığı kaçtır?**

What is the probability of getting a number smaller than 5 when a dice is rolled?

A) $\frac{1}{5}$ B) $\frac{1}{4}$ C) $\frac{1}{3}$ D) $\frac{2}{3}$ E) $\frac{1}{2}$

2. **Bir torbada 2 kırmızı, 5 beyaz, 7 mavi bilye vardır. Torbadan rastgele çekilen bilyenin kırmızı olma olasılığı kaçtır?**

There are 2 red, 5 white, and 7 marbles in a pouch. What is the probability of getting a red marble when a marble is picked randomly from the pouch?

A) $\frac{1}{14}$ B) $\frac{1}{7}$ C) $\frac{3}{14}$ D) $\frac{5}{14}$ E) $\frac{2}{7}$

3. **4 çift, 5 tek sayıdan rastgele seçilen iki sayının toplamının tek olma olasılığı kaçtır?**

What is the probability of picking two numbers such that their sum is an odd number, when two numbers are chosen from among 4 even and 5 odd numbers?

A) $\frac{1}{4}$ B) $\frac{1}{5}$ C) $\frac{1}{10}$ D) $\frac{1}{20}$ E) $\frac{5}{9}$

4. **Üç madeni para atılıyor. Bunlardan ikisinin yazı, birinin tura gelme olasılığı kaçtır?**

What is the probability of getting two tails and one heads when 3 coins are tossed?

A) $\frac{1}{8}$ B) $\frac{1}{4}$ C) $\frac{1}{2}$ D) $\frac{3}{8}$ E) $\frac{5}{8}$

5. **Bir sınıfta 15 kız, 10 erkek öğrenci vardır. Buna göre, sınıftan rastgele seçilen bir öğrencinin kız olma olasılığı kaçtır?**

There are 15 girls and 10 boys in a classroom. What is the probability of choosing a girl when a student is chosen randomly from among the classroom?

A) $\frac{1}{25}$ B) $\frac{1}{20}$ C) $\frac{1}{15}$ D) $\frac{1}{10}$ E) $\frac{3}{5}$

6. **1'den 6'ya kadar numaralandırılan bir zar düz bir zemine atılıyor. Buna göre, üste gelen yüzün asal sayı olma olasılığı kaçtır?**

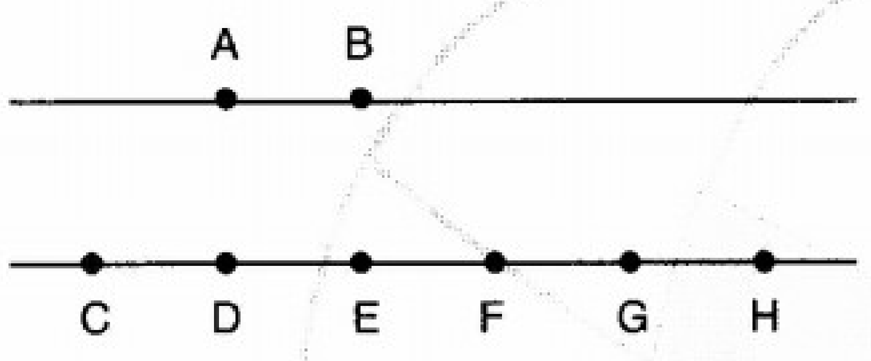
What is the probability of getting a prime number when a dice is rolled?

A) $\frac{1}{6}$ B) $\frac{1}{5}$ C) $\frac{1}{4}$ D) $\frac{1}{3}$ E) $\frac{1}{2}$

7. $P(A) = \frac{3}{5} \Rightarrow P(A') = ?$

A) $\frac{1}{5}$ B) $\frac{2}{5}$ C) $\frac{3}{5}$ D) $\frac{4}{5}$ E) $\frac{1}{2}$

8.



Şekildeki paralel doğrular üzerinde bulunan 8 tane noktadan rastgele seçilen 3 tanesinin bir üçgen oluşturma olasılığı kaçtır?

3 points are chosen from among the points that located on the parallel lines above. What is the probability of choosing 3 points that constitutes a triangle?

A) $\frac{1}{8}$ B) $\frac{1}{64}$ C) $\frac{9}{14}$ D) $\frac{9}{64}$ E) $\frac{2}{9}$

9. **6 kadın 4 erkekten oluşan bir grup içinden rastgele 3 kişi seçiliyor. Buna göre, kişilerin hepsinin erkek olma olasılığı kaçtır?**

3 persons are chosen randomly from among a group of 6 women and 4 men. What is the probability of choosing 3 men?

A) $\frac{2}{3}$ B) $\frac{4}{7}$ C) $\frac{1}{10}$ D) $\frac{1}{20}$ E) $\frac{1}{30}$

10. **Samet ve Selçuk'un bir hedefi vurma olasılığı sırasıyla 2/3 ve 3/4'tür. Buna göre, Samet'in hedefi vurup, Selçuk'un vuramama olasılığı kaçtır?**

The probability of hitting a target by Samet and Selçuk is 2/3 and 3/4, respectively. What is the probability of hitting the target by Samet and missing the target by Selçuk when they shoot at the same time?

A) $\frac{1}{8}$ B) $\frac{1}{6}$ C) $\frac{1}{4}$ D) $\frac{1}{3}$ E) $\frac{1}{2}$

11. $\boxed{1}$ $\boxed{3}$ $\boxed{6}$ $\boxed{7}$ $\boxed{9}$ $\boxed{10}$

Şekildeki gibi üzerine sayıların yazıldığı kartlardan rastgele seçilen ikisinin çarpımının çift sayı olma olasılığı kaçtır?

What is the probability of choosing 2 numbers such that their product is an even number, from among the cards given in the figure?

A) $\frac{1}{5}$ B) $\frac{2}{5}$ C) $\frac{3}{5}$ D) $\frac{4}{5}$ E) $\frac{5}{6}$

12. **Bir gruptaki kadınların sayısı erkeklerin sayısından 3 fazladır. Grupta rastgele seçilen birinin kadın olma olasılığı 8/13 ise, bu grupta kaç erkek vardır?**

In a group, the number of women exceeds the number of men by 3. How many men are there in this group if the probability of choosing a woman when a person is chosen randomly from among the group is 8/13?

A) 5 B) 6 C) 7 D) 8 E) 9

YANITLAR / ANSWERS							
1. D	2. B	3. E	4. D	5. E	6. E	7. B	8. C
9. E	10. B	11. C	12. A				

1. **Bir torbada 1 den 6 ya kadar numaralandırılmış 6 bilye vardır. Bu torbadan çekileni tekrar torbaya koymama koşulu ile sırayla üç bilye çekiliyor. Birinci çekilişte 2 numaralı, ikinci çekilişte 3 numaralı, üçüncü çekilişte 5 numaralı bilyenin çekilmesi olasılığı kaçtır?**

There are 6 marbles which enumerated from 1 to 6 in a pouch. 3 marbles are picked successively from the pouch in condition of not putting back. What is the probability of picking the marble number 2 at the first picking, picking the marble number 3 at the second picking and picking the marble number 5 at the third picking?

A) $\frac{9}{20}$ B) $\frac{37}{60}$ C) $\frac{1}{60}$ D) $\frac{1}{9}$ E) $\frac{1}{120}$

2. **Bir köprüden geçiş ücreti olarak her bir kamyondan 5 TL, dolmuştan 3 TL ve taksiden 2 TL alınmaktadır. Köprüden 2 dolmuş, 2 taksi ve 3 kamyon geçiyor. Köprüden geçen bu 7 araçtan herhangi 5 inden alınan toplam paranın 20 TL olma olasılığı kaçtır?**

The toll for a bridge is 5 tl for a truck, 3 tl for a minibus and 2 tl for a car. If 2 minibus, 2 cars and 3 trucks pass this bridge, what is the probability of getting 20 tl from any of the 5 vehicles from among them?

A) $\frac{1}{7}$ B) $\frac{3}{7}$ C) $\frac{5}{7}$ D) $\frac{4}{21}$ E) $\frac{5}{21}$

3. **Bir sınıfta 8 erkek öğrenci ve 6 kız öğrenci vardır. Bu öğrencilerden seçilen 6 kişilik kurulda, 4 erkek öğrenci ve 2 kız öğrencinin bulunması olasılığı kaçtır?**

There are 8 male, 6 female students in a class. What is the probability of forming a committee that contains 4 male and 2 female students from among the studens in the class?

A) $\frac{25}{78}$ B) $\frac{26}{35}$ C) $\frac{15}{76}$ D) $\frac{5}{34}$ E) $\frac{50}{143}$

4. **Bir sınıfın 18 erkek, 16 kız öğrencisi pikniğe gitmişler ve pikniğe giden kızların ve erkeklerin yarısı güneşten yanıyor. Bu 34 öğrenci arasından rastgele seçilen bir öğrencinin kız ya da güneşten yanmış olma olasılığı kaçtır?**

18 male, 16 female students of a classroom went to picnic and half of the female students and half of the male students had sunburn. What is the probability of choosing 1 male and 1 female students who had sunburn from among these 34 students?

A) $\frac{1}{2}$ B) $\frac{8}{17}$ C) $\frac{4}{17}$ D) $\frac{6}{17}$ E) $\frac{25}{34}$

5. **Üç madeni para birlikte atılıyor. Bu 3 paradan herhangi ikisinin tura, birinin yazı gelme olasılığı kaçtır?**

3 coins are tossed simultaneously. What is the probability of getting 2 heads and 1 tails?

A) $\frac{1}{2}$ B) $\frac{5}{8}$ C) $\frac{3}{8}$ D) $\frac{2}{3}$ E) $\frac{1}{4}$

6. **Bir öğrencinin, matematik sınavından geçme olasılığı 5/6, fizik sınavından geçme olasılığı 1/4 tür. Bu öğrencinin iki sınavdan da geçme olasılığı 1/2 olduğuna göre, bu öğrencinin matematik veya fizik dersinden başarılı olma olasılığı kaçtır?**

For a student; the probability of passing the mathematics test is 5/6, passing the physics test is 1/4. If the probability of passing both lessons is 1/2, what is the probability of passing the mathematics test or the physics test?

A) $\frac{19}{24}$ B) $\frac{13}{24}$ C) $\frac{11}{12}$ D) $\frac{7}{12}$ E) $\frac{3}{4}$

7. **A, B, C isimli üç at yarışacaktır. A ve C nin kendi aralarında yarışı kazanma olasılıkları aynı olduğu halde her birinin B ye göre kazanma olasılığı, B nin kazanma olasılığının üç katıdır. Buna göre, C veya B atının yarışı kazanma olasılığı kaçtır?**

Three horses, named as A,B, and C, participated in a race. If the probability of winning the race of A and C is equal and trebled the probability of winning the race of B. According to that, what is the probability of winning the race of B or C?

A) $\frac{3}{49}$ B) $\frac{4}{49}$ C) $\frac{3}{14}$ D) $\frac{8}{7}$ E) $\frac{4}{7}$

8. **A ve B gibi iki atıcıdan, A nın hedefi vurma olasılığı 1/4 ve B'nin hedefi vurma olasılığı ise 3/5'tir. İki atıcı birlikte hedefe ateş ediyorlar ve hedef vuruluyor. Buna göre, hedefi yalnız birinin vurmuş olması olasılığı kaçtır?**

For two shooters named as A and B, the probability of hitting the target of A is 1/4 and the probability of hitting the target of B is 3/5. Both of the shooters shoot simultaneously and the target is hit. According to that, what is the probability of being hit for the target by only one of the shooters?

A) $\frac{1}{10}$ B) $\frac{7}{20}$ C) $\frac{11}{20}$ D) $\frac{9}{20}$ E) $\frac{1}{2}$

9. **Ali'nin bir sınavdaki sorulardan her birini çözme olasılığı çözememe olasılığının 3 katıdır. 4 soruluk bir sınavda Ali'nin soruların hepsini çözmüş olma olasılığı nedir?**

The probability of Ali to solve each of the questions in an exam is trebled the probability of him not to. In a test that contains 4 questions, what is the probability of Ali to solve all of the questions?

A) $\frac{9}{16}$ B) $\frac{27}{64}$ C) $\frac{9}{32}$ D) $\frac{3}{8}$ E) $\frac{81}{256}$

10. **Hilesiz bir para 6 kez atılıyor. 3 kez tura gelme olasılığı kaçtır?**

What is the probability of getting 3 heads when a coin is tossed 6 times?

A) $\frac{1}{16}$ B) $\frac{3}{16}$ C) $\frac{5}{16}$ D) $\frac{7}{16}$ E) $\frac{9}{16}$

11. **Bir zar peşpeşe 3 kez atılıyor. Bu atışlardan 2 sinde 3, birinde 3 den farklı bir sayı gelme olasılığı nedir?**

What is the probability of getting 3 two times and getting another number for the rest when a dice is rolled 6 times?

A) $\frac{1}{72}$ B) $\frac{5}{72}$ C) $\frac{7}{72}$ D) $\frac{11}{72}$ E) $\frac{13}{72}$

12. **Bir zarın bir yüzü sarı, iki yüzü mavi, üç yüzü de kırmızıdır. Bu zar iki kez atılırsa, iki atış sonunda bir kez mavi bir kez de kırmızı yüzün üzerine düşme olasılığı kaçtır?**

What is the probability of falling down one time on the blue face and one time on the red face when a dice which has one yellow, two blue, and three red faces rolled two times?

A) $\frac{1}{2}$ B) $\frac{1}{3}$ C) $\frac{1}{4}$ D) $\frac{1}{5}$ E) $\frac{1}{6}$

YANITLAR / ANSWERS							
1. E	2. D	3. E	4. C	5. C	6. D	7. E	8. C
9. E	10. C	11. B	12. E				

1. $A \cup B = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$

$A \cap B = \{3, 4, 5, 8\}$

$B \setminus A = \{2, 6, 7\} \Rightarrow$ **$A \setminus B = ?$**

A) $\{2, 4\}$

B) $\{1, 9\}$

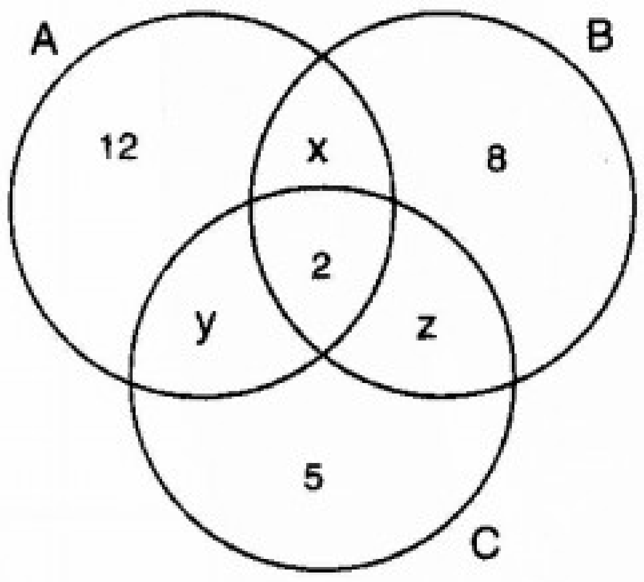
C) $\{1, 7\}$

D) $\{3, 8\}$

E) $\{2, 9\}$

2. $n(A) + n(B) + n(C) = 41$

$\Rightarrow$ **$x + y + z = ?$**



A) 2

B) 4

C) 5

D) 8

E) 10

3. $n(A \cup B) = 21$,

$n(A) = 2 \cdot n(B) - 6$,

$n(A \cap B) = 6 \Rightarrow$ **$n(A \setminus B) = ?$**

A) 7

B) 8

C) 9

D) 10

E) 11

4. $n(A \setminus B) = 3n(B \setminus A) = 2n(A \cap B)$,

$n(A \cup B) = 44 \Rightarrow$ **$n(A) = ?$**

A) 28

B) 30

C) 32

D) 36

E) 40

5. $n(A) = 4n(B \setminus A)$, $n(A \cap B) = 3$

$n(A \setminus B) + n(B \setminus A) = 12 \Rightarrow$ **$n(A \cup B) = ?$**

A) 9

B) 12

C) 15

D) 18

E) 21

6. $A = \{ x \,;\, -3 \le x < 4,\ x \in Z \}$

$B = \{ x;\ |x - 3| < 3,\ x \in Z \}$

$\Rightarrow$ **$n(A \cap B) = ?$**

A) 3

B) 4

C) 5

D) 6

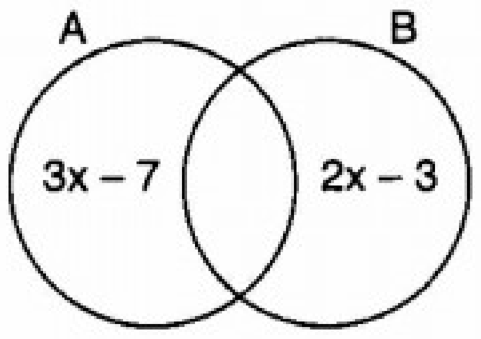
E) 7

7. $n(A-B) = 3x-7$,

$n(B-A) = 2x-3$

$n(A-B) = n(B-A)$

$n(A \cup B) = 14 \Rightarrow$ **$n(A \cap B) = ?$**



A) 2
B) 3
C) 4
D) 5
E) 6

8. **$[-2, 6] \cap [0, 3) = ?$**

A) $[-2, 6]$
B) $[0,3)$
C) $[-2, 0]$
D) $[3, 6]$
E) $(3, 6)$

9. $n(A \cup B) = 20$,

$n(A-B) = 8$,

$n(B-A) = 10 \Rightarrow$ **$n(A \cap B) = ?$**

A) 1
B) 2
C) 3
D) 7
E) 15

10. $n(E) = 42$

$n(A') = 18$

$n(B') = 20$

$n(A' \cap B') = 6 \Rightarrow$ **$n(A \cap B) = ?$**

A) 6
B) 7
C) 8
D) 10
E) 12

11. $A = \{x \mid 150 < x < 500,\ x = 4 \cdot k,\ k \in Z\}$

$B = \{y \mid 48 \le y < 450,\ y = 6 \cdot m,\ m \in Z\}$

$n(A \cap B) = ?$

A) 23
B) 24
C) 25
D) 26
E) 27

12. $A = \{x \mid x \in Z,\ x^2 \le 4\}$

$B = \{x \mid x \in Z,\ |x| \le 1\} \Rightarrow$ **$B - A = ?$**

A) A
B) B
C) $\{-1, 1, 2\}$
D) Ø
E) $\{-1, 0, 1\}$

YANITLAR / ANSWERS

1. B	**2. C**	**3. D**	**4. D**	**5. C**	**6. A**	**7. C**	**8. B**
9. B	**10. D**	**11. C**	**12. D**				

1.

$$\left.\begin{array}{l} A \cup B = \{1, 2, 3, 4, 5, 6, 7, 8, 9\} \\ A \cap B = \{3, 4, 5, 8\} \end{array}\right\} \Rightarrow B = \{2, 3, 4, 5, 6, 7, 8\}$$

$$\left.\begin{array}{r} A \cup B = \{1, 2, 3, 4, 5, 6, 7, 8, 9\} \\ B = \{2, 3, 4, 5, 6, 7, 8\} \end{array}\right\} \Rightarrow A \setminus B = \{1, 9\}$$

Yanıt / The Answer is B

2.

$$\begin{array}{rl} & n(A) = 12 + 2 + x + y \\ & n(B) = 8 + 2 + x + z \\ + & n(C) = 5 + 2 + y + z \\ \hline \end{array}$$

$$\begin{aligned} n(A) + n(B) + n(C) &= 31 + 2(x + y + z) \\ 41 &= 31 + 2(x + y + z) \\ 10 &= 2(x + y + z) \\ 5 &= x + y + z \end{aligned}$$

Yanıt / The Answer is C

3.

$n(A \cup B) = n(A) + n(B) - n(A \cap B)$

$n(A \cup B) = 2 \cdot n(B) - 6 + n(B) - n(A \cap B)$

$$\begin{aligned} 21 &= 3 \cdot n(B) - 6 - 6 \\ 33 &= 3 \cdot n(B) \\ 11 &= n(B) \end{aligned}$$

$n(B) = 11 \Rightarrow n(A) = 16$

$n(A \setminus B) = n(A) - n(A \cap B)$

$n(A \setminus B) = 16 - 6 = 10$

Yanıt / The Answer is D

4.

$n(A \setminus B) = 3 \cdot n(B \setminus A) = 2 \cdot n(A \cap B),$

$$\Rightarrow \begin{aligned} n(A \setminus B) &= 6k \\ n(B \setminus A) &= 2k \\ n(A \cap B) &= 3k \end{aligned}$$

$n(A) = 9k, \quad n(B) = 5k$

$n(A \cup B) = n(A) + n(B) - n(A \cap B)$

$$\begin{aligned} 44 &= 9k + 5k - 3k \\ 44 &= 11k \\ 4 &= k \end{aligned}$$

$\Rightarrow n(A) = 9k = 9 \cdot 4 = 36$

Yanıt / The Answer is D

5.

$n(A \cup B) = n(A) + n(B) - n(A \cap B)$

$$\begin{aligned} \Rightarrow n(A \cup B) &= n(A \setminus B) + n(B \setminus A) + n(A \cap B) \\ &= 12 + 3 \\ &= 15 \end{aligned}$$

Yanıt / The Answer is C

6.

$A = \{-3, -2, -1, 0, 1, 2, 3\}$

$|x - 3| < 3 \Rightarrow -3 < x - 3 < 3$

$0 < x < 6$

$B = \{1, 2, 3, 4, 5\}$

$A \cap B = \{1, 2, 3\} \Rightarrow n(A \cap B) = 3$

Yanıt / The Answer is A

7. $n(A-B) = n(B-A) \Rightarrow 3x-7 = 2x-3$

$x = 4$

$n(A-B) = 5,\ n(B-A) = 5$

$n(A \cup B) = n(A-B) + n(B-A) + n(A \cap B)$

$14 = 5 + 5 + n(A \cap B)$

$n(A \cap B) = 4$

Yanıt / The Answer is C

---

8. $[-2, 6] = \{x \mid -2 \le x \le 6,\ x \in R\}$

$[0, 3) = \{x \mid 0 \le x < 3,\ x \in R\}$

$[-2, 6] \cap [0, 3) = \{x \mid 0 \le x < 3,\ x \in R\}$

$= [0, 3)$

Yanıt / The Answer is B

---

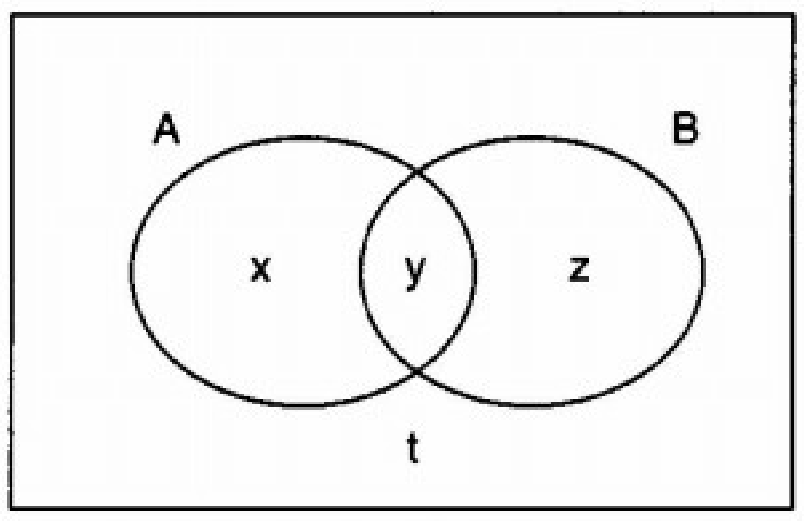
9. $n(A \cup B) = n(A-B) + n(B-A) + n(A \cap B)$

$20 = 8 + 10 + n(A \cap B)$

$n(A \cap B) = 2$

Yanıt / The Answer is B

10.



$n(A' \cap B') = n(A \cup B)' = t = 6$

$n(A') = z + t = 18 \Rightarrow z = 12$

$n(B') = x + t = 20 \Rightarrow x = 14$

$n(E) = x + y + z + t = 42 \Rightarrow n(A \cap B) = y = 10$

Yanıt / The Answer is D

---

11. $A = \{x \mid 150 < x < 500,\quad x = 4 \cdot k,\ k \in Z\}$

$B = \{y \mid 48 \le y < 450,\quad y = 6 \cdot m,\ m \in Z\}$

$A \cap B = \{z \mid 150 < z < 450,\ z = 12 \cdot n,\ n \in Z\}$

$$\Rightarrow n(A \cap B) = \frac{450 - 150}{12} = 25$$

Yanıt / The Answer is C

---

12. $A = \{-2, -1, 0, 1, 2\}$

$B = \{-1, 0, 1\} \Rightarrow B - A = \varnothing$

Yanıt / The Answer is D

1. $\mathbf{[(A\cap B)\cup(A\cap C)\cup(B\cap C)]'\cap(A\cap B\cap C)=?}$

Yanıt / The Answer is: $\varnothing$

---

2. $A=\{\,x \mid |x-2|<8;\ x\in Z\}$

$B=\{\,x \mid |2-x|<4;\ x\in Z\}$

$\Rightarrow \mathbf{n(A\setminus B)=?}$

Yanıt / The Answer is: **8**

---

3. $n(A)=8,$

$n(B)=6,$

$n(A\cap B)\neq 0$

$\Rightarrow \mathbf{max(n(A-B))+min(n(A-B))=?}$

Yanıt / The Answer is: **9**

---

4. $A,\ B\neq\varnothing\quad A,\ B\subset E$

$n(A\cap B)'=55,\ n(A\cup B)'=12$

$n(A)+n(B)=45 \quad\Rightarrow\quad \mathbf{n(E)=?}$

Yanıt / The Answer is: **56**

---

5. $\frac{1}{3}\cdot n(A\setminus B)=3\cdot n(B\setminus A)=\frac{1}{5}\cdot n(A\cap B)$

$n(A\cup B)=50 \quad\Rightarrow \mathbf{n(A\cap B)=?}$

Yanıt / The Answer is: **30**

---

6. $n(A\cup B)=34$

$n(A\cap B')=2\cdot n(B\cap A')$ ve (and)

$n(A\cap B)=4\ \Rightarrow\ \mathbf{n(A)=?}$

Yanıt / The Answer is: **24**

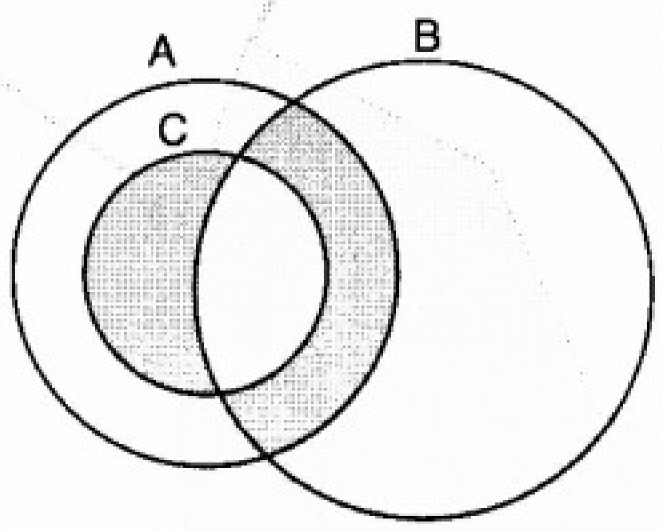
7. $n(A\cap B') + n(B\cap A') = 6 \cdot n(A\cap B)$

$n(A) = 3 \cdot n(B)$ ve (and) $n(A\cup B) = 42 \Rightarrow$ **$n(A) = ?$**

Yanıt / The Answer is: **36**

8. **Taralı alan = ?**

Shaded area



Yanıt / The Answer is: **$[\,(A\cap B) \setminus C) \cup (C \setminus B)\,]$**

9. $n(A) = 3 \cdot n(B)$

$4 \cdot n(A \cap B) = n(B \setminus A)$

$n(A \cup B) = 38 \;\Rightarrow\;$ **$n(A \setminus B) = ?$**

Yanıt / The Answer is: **28**

10. $n(A \setminus B) = 9, \quad n(B \setminus A) = 7,$

$n(A) + n(B) = 36 \;\Rightarrow\;$ **$n(A \cup B) = ?$**

Yanıt / The Answer is: **26**

11. $A = \{x \mid 3 \le x \le 1600,\ \ x = 6k,\ \ k \in N\}$

$B = \{y \mid 8 < y < 1200,\ \ y = 9n,\ \ n \in N\}$

$n(A \cap B) = ?$

Yanıt / The Answer is: **66**

12. $A = \{x \mid 100 < x \le 400,\ x = 8 \cdot k,\ k \in Z\}$

$B = \{y \mid 75 \le y < 390,\ y = 6 \cdot m,\ m \in Z\}$

$n(A\cup B) = ?$

Yanıt / The Answer is: **78**

1. $A = \{x \mid |x - 1| \le 5\}$,

$B = \{x \mid |x + 1| < 4\}$

$\Rightarrow$ **$A \cap B = ?$**

A) $(-5, 6)$ B) $[-4, 5)$ C) $[-4, 3)$

D) $(-2, 6]$ E) $[0, 4]$

2. $n(A \cap B) = 6$, $n(A) = 22$

$n(B \cap C) = 5$, $n(B) = 17$

$n(A \cap C) = 8$, $n(C) = 24$

$n(A \cap B \cap C) = 4$

$\Rightarrow$ **$n(A \cup B \cup C) = ?$**

A) 38 B) 40 C) 42

D) 45 E) 48

3. $A \subset B \subset C \Rightarrow$ **$(A' \cap C') \cup (A' \cap B') = ?$**

A) A B) B C) C

D) A′ E) B′

4. $E = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$,

$A' = \{3, 5, 8, 9, 10\}$,

$B = \{2, 3, 4, 6, 7, 8\}$

$\Rightarrow$ **$A \cap B' = ?$**

A) {1} B) {2} C) {3}

D) {4, 6} E) {5, 8}

5. $n(A) = 10$,

$n(B) = 7$,

$n(A \setminus B) = 5 \Rightarrow$ **$n(A \cup B) = ?$**

A) 8 B) 9 C) 10

D) 11 E) 12

6. $A \cup B = E$,

$A \cap B \ne \varnothing$,

$n(A) = 12$,

$n(B) = 15 \Rightarrow$ **$\max [n(A \cap B)'] = ?$**

A) 23 B) 24 C) 25

D) 26 E) 27

7. $n(A \cup B) = 28$,

$n(A) = 2 \cdot n(B) = 3 \cdot n(A \cap B)$

$\Rightarrow$ **$n(B \setminus A) = ?$**

A) 4 B) 7 C) 8 D) 16 E) 20

8. $n(E) = 35$,

$n(A') = 12$,

$n(B') = 21$,

$n(A \cup B) = 24$

$\Rightarrow$ **$n(A \cap B) = ?$**

A) 11 B) 12 C) 13 D) 14 E) 15

9. $n(E) = n(A \cup B \cup C) = 30$,

$A \subset B$,

$A \cap C = \varnothing$

$n(B \cap C) = 6$

$n(A \setminus C) = 8$

$n(C') = 17$

$\Rightarrow$ **$n(C \setminus B) = ?$**

A) 5 B) 6 C) 7 D) 8 E) 9

10. **Taralı Alan**

The shaded Area = ?

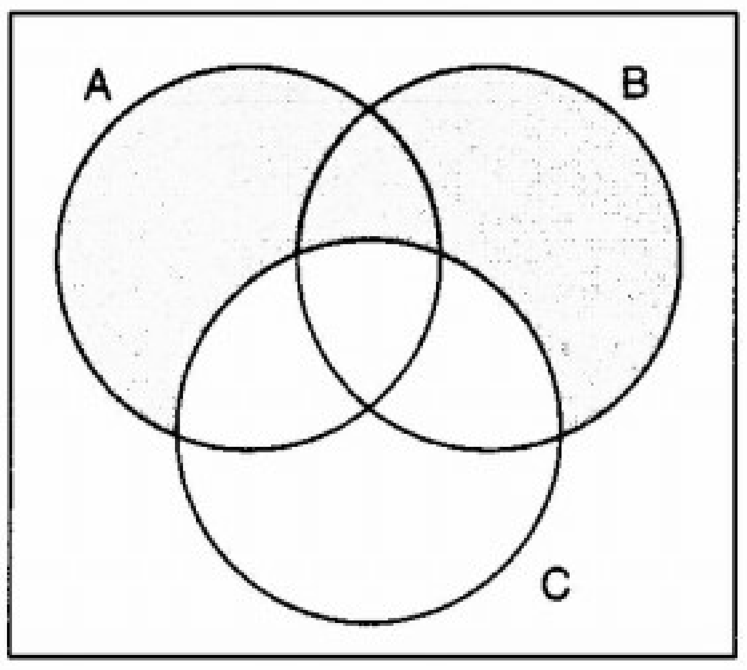
A) $(A \cup B) \setminus C$

B) $(A \setminus B) \cup C$

C) $C \setminus (A \cap B)$

D) $(A \cup B) \cap C$

E) $(A \setminus B) \cup (C \setminus B)$



11. $A = (2, 6]$,

$B = [-1, 5]$

$\Rightarrow$ **$A \cap B = ?$**

A) $(2, 3]$ B) $[0, 5]$ C) $(2, 5]$ D) $(2, 4)$ E) $[3, 5]$

12. $A = (-1, 7]$ $B = [3, 10)$ $\Rightarrow$ **$A \setminus B = ?$**

A) $(-1, 3)$ B) $(-1, 3]$ C) $(-2, 7)$ D) $[-2, 7]$ E) $(3, 8)$

YANITLAR / ANSWERS

1. C	**2. E**	**3. E**	**4. A**	**5. E**	**6. C**	**7. A**	**8. C**
9. C	**10. A**	**11. C**	**12. A**				

1. $n(A \cup B) = 11$,

$3 \cdot n(A) = n(B)$,

$n(A \cap B) = 1$

$\Rightarrow$ **$n(B \setminus A) = ?$**

A) 5 B) 6 C) 7

D) 8 E) 9

2. $n(A) = 8$,

$n(B) = 3$,

$n(A \cap B) \neq \varnothing$,

$B \not\subset A$

$\Rightarrow$ **$\max(n(A \cup B)) + \min(n(A \cup B)) = ?$**

A) 17 B) 18 C) 19

D) 20 E) 21

3. $n(A \cap B') = 2n(A \cap B) = 3n(B \setminus A)$,

$n(A \cup B) = 44$

$\Rightarrow$ **$n(B) = ?$**

A) 16 B) 18 C) 20

D) 22 E) 24

4. $n[(A \setminus B) \cup (B \setminus A)] = 12$,

$n(A' \cup B') = 16$

$\Rightarrow$ **$n(A \cup B)' = ?$**

A) 1 B) 4 C) 6

D) 8 E) 12

5. **$[A \cup (A \cup B')'] \cap (A \cup B') = ?$**

A) A B) B C) A′

D) B′ E) ∅

6. $(B \cap C) \cup (A \cap C) = \varnothing$,

$n(A \cup B)' = 10$,

$n(A \cup B \cup C)' = 4$

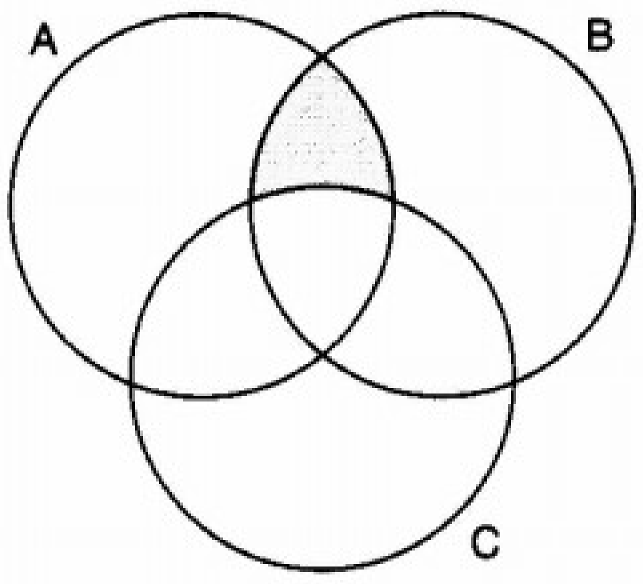
$\Rightarrow$ **$n(C) = ?$**

A) 3 B) 4 C) 5

D) 6 E) 7

7. **Taralı Alan**

The shaded Area = ?



A) $(A \cup B) \setminus C$

B) $C \setminus (A \cup B)$

C) $(A \cap C) \setminus B$

D) $(B \cap C) \setminus A$

E) $(A \cap B) \setminus C$

8. $A = \{x \mid 100 < x \leq 400,\ x = 3k,\ k \in N\}$

$B = \{y \mid 150 \leq y < 450,\ y = 4k,\ k \in N\}$

$\Rightarrow$ **$n(A \cap B) = ?$**

A) 19 B) 20 C) 21

D) 22 E) 23

9. $A = (-3, 5]$,

$B = [1, 8)$

$\Rightarrow$ **$A \cap B = ?$**

A) [1, 5] B) [2, 4] C) [–2, 6)

D) (1, 7) E) [0, 6)

10. $n(A \setminus B') = 3$,

$n(A' \cap B) = 5$,

$n(A \cup B) = 16$

$\Rightarrow$ **$n(A \cap B') = ?$**

A) 4 B) 5 C) 6

D) 7 E) 8

11. $n(A \setminus B) = 4$,

$n(B') = 7$,

$n(A') = 8$,

$n(A \cup B) = 21$

$\Rightarrow$ **$n(A \cap B) = ?$**

A) 6 B) 8 C) 9

D) 10 E) 12

12. $C \subset B \subset A$,

$n(C') = 9$,

$n(B') = 2$,

$n(C) = 1$

$\Rightarrow$ **$n(B) = ?$**

A) 4 B) 5 C) 6

D) 7 E) 8

YANITLAR / ANSWERS

1. D	**2. C**	**3. C**	**4. B**	**5. A**	**6. D**	**7. E**	**8. C**
9. A	**10. E**	**11. E**	**12. E**				

1. $A \not\subset B$,

$A \cap B \neq \varnothing$,

$n(A) = 20$,

$n(B) = 12$

$\Rightarrow$ $\max(n(A \cup B)) + \min(n(A \cup B)) = ?$

A) 49

B) 50

C) 51

D) 52

E) 53

2. $n(A \cup B) = 2 \cdot n(A' \cap B) = 3 \cdot n(A \cap B)$,

$n(A) = 24$

$\Rightarrow$ $n(B) = ?$

A) 8

B) 16

C) 24

D) 32

E) 40

3. $n(A) + n(B') = 12$,

$n(A') + n(B) = 8$,

$n(C') = 4$

$\Rightarrow$ $n(C) = ?$

A) 4

B) 5

C) 6

D) 7

E) 8

4. $A = \{x \mid 50 < x \leq 120,\ x = 3k,\ k \in N\}$

$B = \{y \mid 70 < y \leq 150,\ y = 2k,\ k \in N\}$

$\Rightarrow$ $n(A \setminus B) = ?$

A) 14

B) 15

C) 16

D) 17

E) 18

5. $E = \{1, 2, 3, 4, 5, 6\}$,

$(A \cup B)' = \{3\}$,

$A \setminus B = \{1\}$,

$A' \cup B' = \{1, 3, 5\}$

$\Rightarrow$ $B = ?$

A) {2, 4, 5, 6}

B) {1, 2, 3}

C) {2, 3, 4}

D) {3, 5, 6}

E) {1, 4, 5, 6}

6. $n(E) = 42$,

$n(A' \cap B') = 8$,

$n(B) = 12$,

$n(A') = 10$

$\Rightarrow$ $n(A \cap B) = ?$

A) 5

B) 6

C) 8

D) 9

E) 10

7. $n(A \cup B) = 20$,

$n(A \cap B) = 4$,

$2 \cdot n(A) = n(B)$

$\Rightarrow$ **$n(A) = ?$**

A) 7

B) 8

C) 9

D) 10

E) 11

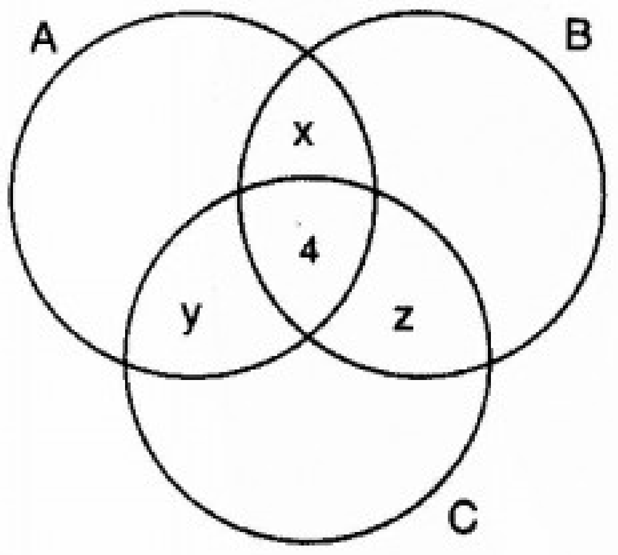
8. $n(A \cup B \cup C) = 30$,

$n(A) = 15$,

$n(B) = 14$,

$n(C) = 16$

$\Rightarrow$ **$x + y + z = ?$**



A) 5 B) 6 C) 7

D) 8 E) 9

9. $n(A' \cap B') = 2$,

$n(A) = 12$,

$n(E) = 20$

$\Rightarrow$ **$n(B \setminus A) = ?$**

A) 6

B) 7

C) 8

D) 9

E) 10

10. $A = \{x \mid |x| > 3,\ x \in R\}$,

$B = \{x \mid |x - 1| \leq 4,\ x \in R\}$

$\Rightarrow$ **$A \cap B = ?$**

A) (1, 3]

B) (2, 4]

C) (3, 5]

D) (4, 6]

E) (5, 7]

11. $n(A) + n(B) = n(A \cup B)$,

$n(A) = 8$,

$n(B') = 10$

$\Rightarrow$ **$n(A' \cap B') = ?$**

A) 1 B) 2 C) 3

D) 4 E) 5

12. $A = \{x \mid 50 < x \leq 100,\ x = 2k,\ k \in N\}$,

$B = \{y \mid 60 \leq x < 120,\ x = 3k,\ k \in N\}$

$\Rightarrow$ **$n(A \cup B) = ?$**

A) 34 B) 35 C) 36

D) 37 E) 38

YANITLAR / ANSWERS

1. D 2. E 3. C 4. B 5. A 6. E 7. B 8. C

9. A 10. C 11. B 12. E

1. $f(x) = 2x + 1 \Rightarrow$ **$f([-1, 4)) = ?$**

A) $[-1, 9]$

B) $[-1, 9)$

C) $(-1, 9]$

D) $(-1, 9)$

E) $\{-1, 9\}$

2. $f(2x + 1) = 6x + 4 \Rightarrow$ **$f(1) = ?$**

A) 3

B) 4

C) 5

D) 6

E) 10

3. $f(x) = \begin{cases} 2x-5, & x<1 \\ \dfrac{x}{2}, & x \geq 3 \end{cases} \Rightarrow$ **$f(4) + 2 \cdot f(0) = ?$**

A) 3

B) 2

C) -8

D) -9

E) -10

4. $f, g : R \to R$,

$f(x) = x + 1$,

$g(x) = x^3 \Rightarrow$ **$(gof^{-1})(-1) = ?$**

A) -6

B) -8

C) -10

D) -12

E) -27

5. $\left.\begin{array}{l} f(x) = 2x+15 \\ g(x) = 8x-1 \end{array}\right\} \Rightarrow$ **$(g^{-1}of)(0) = ?$**

A) -2

B) -1

C) 0

D) 1

E) 2

6. $a > 0$,

$f(x) = \dfrac{-3x}{x+a}$, $f(x) = f^{-1}(x) \Rightarrow$ **$a = ?$**

A) 1

B) 2

C) 3

D) 4

E) 6

7. $f\left(\frac{2x-1}{3x+1}\right)=\frac{x-1}{x-2} \Rightarrow$ **$f^{-1}(2)=?$**

A) $\frac{1}{2}$ B) $-\frac{1}{2}$ C) $\frac{1}{4}$

D) $-\frac{1}{4}$ E) -1

8. $f(x) = x + 2,$

$(fog)(x)=\frac{x+1}{x-2} \Rightarrow$ **$g(x)=?$**

A) $\frac{x-1}{x-2}$ B) $\frac{-x+1}{x-2}$ C) $\frac{-x+3}{x-2}$

D) $\frac{-x+5}{x-2}$ E) $\frac{x+5}{x-2}$

9. $f : R \rightarrow R,$

$2 \cdot f(x-2) + 3 \cdot f(2+x) = x + 5 \Rightarrow$ **$f(1) = ?$**

A) -3 B) $-\frac{7}{5}$ C) -1

D) $\frac{2}{5}$ E) $\frac{28}{25}$

10. $f^{-1}\left(\frac{4x+m}{x+1}\right)=3x-4$, $f(5)=2 \Rightarrow$ **$m=?$**

A) -4 B) -3 C) 5

D) 6 E) 7

11. $f(x) = ax + b,$

$g(x) = 3x - 2,$

$(gof)(x) = g^{-1}(x) \Rightarrow$ **$a + b = ?$**

A) 1 B) 2 C) 3

D) 4 E) 5

12. $\left.\begin{array}{l} f(x)=\frac{x^2-2}{x-1} \\ g(x)=x+1 \end{array}\right\} \Rightarrow$ **$(fog^{-1})(3)=?$**

A) 2 B) 3 C) 4

D) 5 E) 6

YANITLAR / ANSWERS

1. B	2. B	3. C	4. B	5. E	6. C	7. A	8. D
9. E	10. A	11. A	12. A				

1. $f(x) = 2x + 1$

$x = -1 \Rightarrow f(-1) = 2 \cdot (-1) + 1$

$= -1$

$x = 4 \Rightarrow f(4) = 2 \cdot 4 + 1 = 9$

$\Rightarrow f([-1, 4)) = [-1, 9)$

Yanıt / The Answer is B

2. $2x + 1 = 1$

$2x = 0$

$x = 0 \Rightarrow f(1) = 6 \cdot 0 + 4 = 4$

Yanıt / The Answer is B

3. $4 > 3 \Rightarrow f(x) = \frac{x}{2}$

$f(4) = \frac{4}{2} = 2$

$0 < 1 \Rightarrow f(x) = 2x - 5$

$f(0) = 2 \cdot 0 - 5 = -5$

$f(4) + 2 \cdot f(0) = 2 + 2 \cdot (-5)$

$= 2 - 10 = -8$

Yanıt / The Answer is C

4. $f(x) = x + 1 \Rightarrow f^{-1}(x) = x - 1$

$g(x) = x^3$

$(gof^{-1})(x) = g[f^{-1}(x)]$

$= (x - 1)^3$

$(gof^{-1})(-1) = (-1 - 1)^3 = -8$

Yanıt / The Answer is B

5. $f(x) = 2x + 15$

$g(x) = 8x - 1 \Rightarrow g^{-1}(x) = \frac{x+1}{8}$

$(g^{-1}of)(0) = g^{-1}(2 \cdot 0 + 15)$

$= g^{-1}(15)$

$= \frac{15+1}{8}$

$= 2$

Yanıt / The Answer is E

6. $f(x) = \frac{-3x}{x+a} \Rightarrow f^{-1}(x) = \frac{-ax}{x+3}$

$\frac{-3x}{x+a} = \frac{-ax}{x+3}$

$3x + 9 = ax + a^2$

$a^2 = 9$

$a = 3$

Yanıt / The Answer is C

7. $$f\left(\frac{2x-1}{3x+1}\right)=\frac{x-1}{x-2} \Rightarrow f^{-1}\left(\frac{x-1}{x-2}\right)=\frac{2x-1}{3x+1}$$

$$\frac{x-1}{x-2}=2 \Rightarrow 2x-4=x-1$$
$$x=3$$

$$f^{-1}(2)=\frac{2\cdot3-1}{3\cdot3+1}=\frac{5}{10}=\frac{1}{2}$$

Yanıt / The Answer is A

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8. $$f(x)=x+2 \Rightarrow f^{-1}(x)=x-2$$

$$(f^{-1} \circ (f\circ g)(x))=g(x)$$

$$\frac{x+1}{x-2}-2=g(x)$$

$$g(x)=\frac{x+1-2x+4}{x-2}=\frac{-x+5}{x-2}$$

Yanıt / The Answer is D

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9. $$f(x)=ax+b \Rightarrow f(x-2)=ax-2a+b$$
$$f(x)=ax+b \Rightarrow f(2+x)=ax+2a+b$$
$$2\cdot f(x-2)+3\cdot f(2+x)=x+5$$
$$2ax-4a+2b+3ax+6a+3b=x+5$$
$$5ax+2a+5b=x+5$$

$$5a=1 \Rightarrow a=\frac{1}{5}$$

$$2\cdot\frac{1}{5}+5b=5 \Rightarrow b=\frac{23}{25}$$

$$f(x)=\frac{x}{5}+\frac{23}{25}$$

$$f(1)=\frac{1}{5}+\frac{23}{25}=\frac{28}{25}$$

Yanıt / The Answer is E

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10. $$f(5)=2 \Rightarrow f^{-1}(2)=5$$

$$f^{-1}\left(\frac{4x+m}{x+1}\right)=3x-4 \Rightarrow 3x-4=5$$
$$x=3$$

$$\Rightarrow \frac{4\cdot x+m}{x+1}=2$$
$$\frac{4\cdot3+m}{3+1}=2$$
$$m=-4$$

Yanıt / The Answer is A

---

11. $$\left.\begin{array}{l} f(x)=ax+b \\ g(x)=3x-2 \end{array}\right\} \Rightarrow (g\circ f)(x)=3\cdot(ax+b)-2$$

$$(g\circ f)(x)=g^{-1}(x)$$

$$3ax+3b-2=\frac{x+2}{3}$$

$$9ax+9b-6=x+2$$

$$\Rightarrow a=\frac{1}{9},\ b=\frac{8}{9}$$

$$a+b=\frac{1}{9}+\frac{8}{9}=\frac{9}{9}=1$$

Yanıt / The Answer is A

---

12. $$g(x)=x+1 \Rightarrow g^{-1}(x)=x-1$$

$$(f\circ g^{-1})(3)=f(3-1)$$
$$=f(2)$$
$$=\frac{2^2-2}{2-1}=2$$

Yanıt / The Answer is A

1. $f(x\cdot y) = f(x) + f(y),\ f(2) = 5 \Rightarrow \mathbf{f(8) = ?}$

A) 15

B) 25

C) 45

D) 75

E) 125

2. $g(x) = 2^x + 1 \Rightarrow \mathbf{g^{-1}(9) = ?}$

A) 2

B) 3

C) 4

D) 5

E) 6

3. $f(4x-2) = \dfrac{3x-1}{x-2} \Rightarrow \mathbf{f^{-1}(8) = ?}$

A) –3

B) 5

C) 10

D) 13

E) 17

4. $f(x) = \begin{cases} 4x+3 & x<1 \\ x^2+1 & x\geq 1 \end{cases}$

$g(x) = 2x + 5 \Rightarrow \mathbf{fog(-1) = ?}$

A) 7

B) 8

C) 9

D) 10

E) 11

5. $f(2x^2 - x) = 4x^2 - 2x + 5 \Rightarrow \mathbf{f(3) = ?}$

A) 7

B) 8

C) 9

D) 10

E) 11

6. $f(x) = 4x - 9,$

$(g^{-1}of)(-2) = 5 \Rightarrow \mathbf{g(5) = ?}$

A) –17

B) –19

C) –21

D) –23

E) –25

7. $f(x + 1) = 3x - 2$

$g(x - 1) = 4x + 5 \Rightarrow$ **$gof^{-1}(4) = ?$**

A) 21

B) 22

C) 23

D) 24

E) 25

8. $f(x) = 3x^2 + 4$, $g(x) = 3x - 2$

$[f^{-1} og]^{-1} (x) = x^2 + a \Rightarrow$ **$a = ?$**

A) 2

B) 3

C) 4

D) 5

E) 6

9. $f(x, y) = \max(x^2 - 2, xy + 3)$

$g(x,y) = \min(3x + y, 2x - y)$

$\Rightarrow f(-1, 4) + g(-2, 5) = ?$

A) –15

B) –13

C) –10

D) –6

E) –3

10. $f(x) = ax + b$, $f^{-1}(7) = 3$,

$f^{-1}(-5) = -1 \Rightarrow$ **$f^{-1}(10) = ?$**

A) 1

B) 2

C) 3

D) 4

E) 5

11. $\dfrac{fof^{-1}(2)+f(1)}{f^{-1}(-2)+f(0)} = ?$

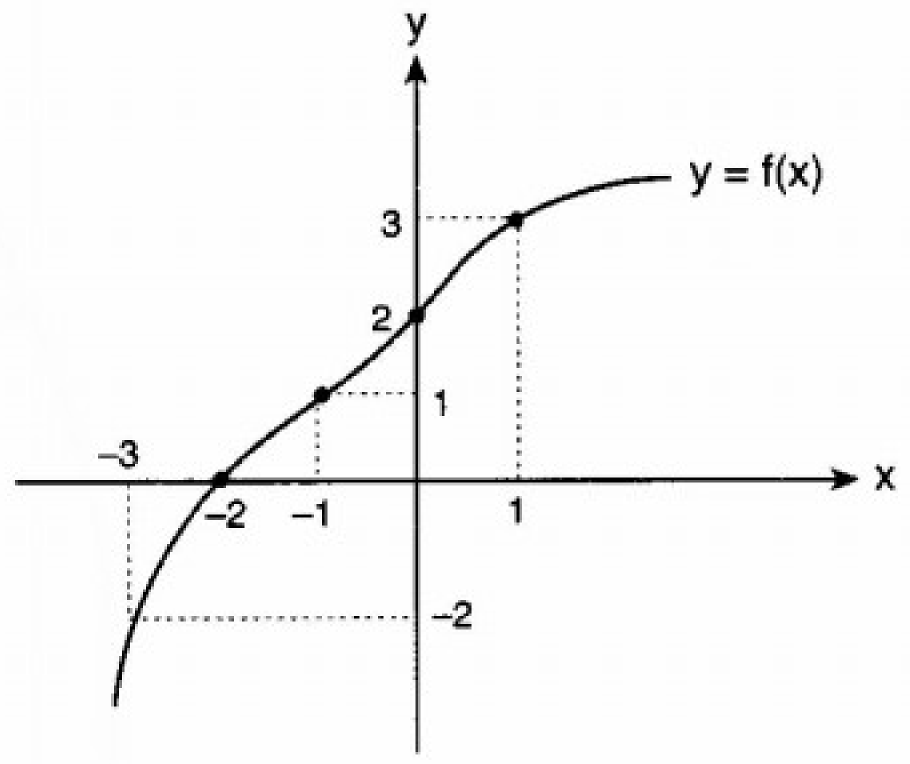
A) –5

B) –4

C) –3

D) –2

E) –1



12. $\dfrac{f(f(1))}{f^{-1}(-3)+f(3)} = ?$

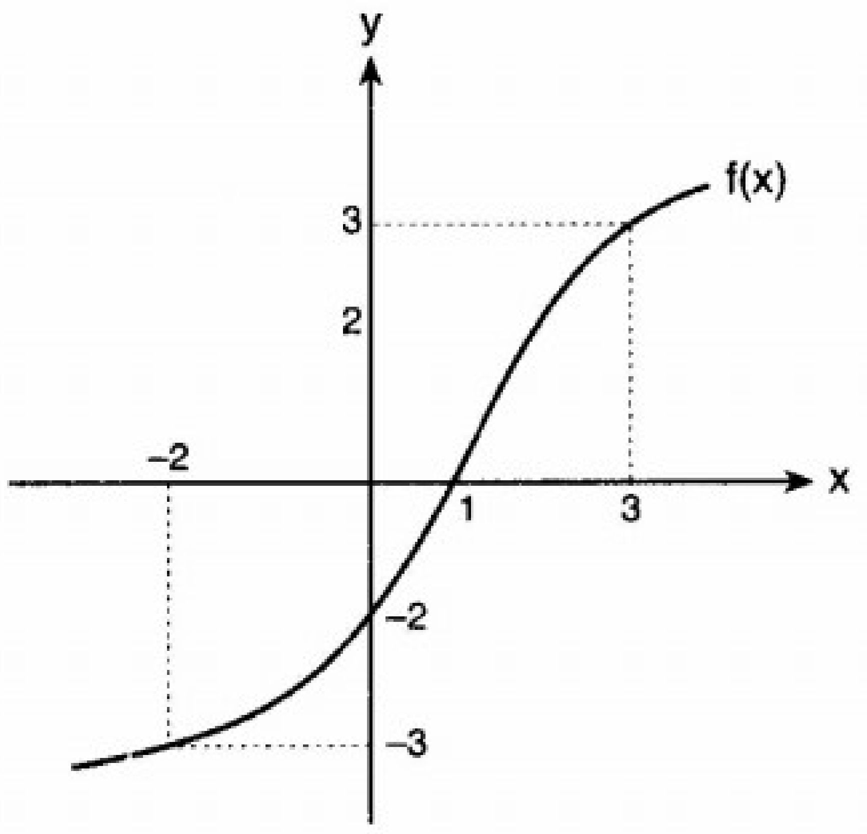
A) –2

B) –1

C) 0

D) 1

E) 2



YANITLAR / ANSWERS

1. A	2. B	3. C	4. D	5. E	6. A	7. A	8. A
9. C	10. D	11. A	12. A				

1. $f(8) = f(2 \cdot 4)$

$f(8) = f(2) + f(4)$

$f(8) = f(2) + f(2 \cdot 2)$

$f(8) = f(2) + f(2) + f(2)$

$f(2) = 5 \Rightarrow f(8) = 3 \cdot 5 = 15$

Yanıt / The Answer is A

2. $g(x) = 2^x + 1 \Rightarrow g^{-1}(2^x + 1) = x$

$2^x + 1 = 9 \Rightarrow x = 3$

$g^{-1}(9) = 3$

Yanıt / The Answer is B

3. $$f(4x-2) = \frac{3x-1}{x-2}$$

$$f^{-1}\left(\frac{3x-1}{x-2}\right) = 4x-2$$

$$\frac{3x-1}{x-2} = 8 \Rightarrow 3x-1 = 8x-16$$

$$15 = 5x$$

$$x = 3$$

$$f^{-1}(8) = 4 \cdot 3 - 2 = 10$$

Yanıt / The Answer is C

4. $fog(-1) = f(g(-1))$

$g(x) = 2x + 5 \Rightarrow g(-1) = 2 \cdot (-1) + 5$

$g(-1) = 3$

$f(g(-1)) = f(3)$

$3 \geq 1 \Rightarrow f(x) = x^2 + 1$

$f(3) = 3^2 + 1$

$f(3) = 10$

Yanıt / The Answer is D

5. $f(2x^2 - x) = 4x^2 - 2x + 5$

$f(2x^2 - x) = 2 \cdot (2x^2 - x) + 5$

$\Rightarrow f(3) = 2 \cdot 3 + 5 = 11$

Yanıt / The Answer is E

6. $f(x) = 4x - 9,$

$(g^{-1}of)(-2) = 5$

$g^{-1}(f(-2)) = 5$

$g(5) = f(-2)$

$= 4 \cdot (-2) - 9 = -17$

Yanıt / The Answer is A

7. $f(x+1) = 3x-2 \Rightarrow f(x) = 3x-5$

$g(x-1) = 4x+5 \Rightarrow g(x) = 4x+9$

$gof^{-1}(4) = g(f^{-1}(4))$

$$f^{-1}(x) = \frac{x+5}{3} \Rightarrow f^{-1}(4) = 3$$

$$g(f^{-1}(4)) = g(3) = 4 \cdot 3 + 9 = 21$$

Yanıt / The Answer is A

8. $$\left[f^{-1}og\right]^{-1}(x) = (g^{-1}of)(x) = x^2 + a$$

$$g^{-1}(x) = \frac{x+2}{3} \Rightarrow (g^{-1}of)(x) = \frac{3x^2+4+2}{3}$$

$$(g^{-1}of)(x) = x^2 + 2 = x^2 + a \Rightarrow a = 2$$

Yanıt / The Answer is A

9. $f(x, y) = \max(x^2-2, xy+3) \Rightarrow f(-1, 4) = -1$

$g(x,y) = \min(3x+y, 2x-y) \Rightarrow g(-2, 4) = -9$

$\Rightarrow f(-1, 4) + g(-2, 5) = (-1) + (-9) = -10$

Yanıt / The Answer is C

10. $f^{-1}(7) = 3 \Rightarrow f(3) = 7$

$f^{-1}(-5) = -1 \Rightarrow f(-1) = -5$

$f(x) = ax+b \Rightarrow 3a+b = 7$

$-a+b = -5$

$\Rightarrow a = 3,\ b = -2$

$$f(x) = 3x-2$$

$$f^{-1}(x) = \frac{x+2}{3}$$

$$f^{-1}(10) = \frac{10+2}{3}$$

$$f^{-1}(10) = \frac{12}{3} = 4$$

Yanıt / The Answer is D

11. $(fof^{-1})(2) = I(2) = 2$

$f(1) = 3,$

$f(0) = 2,$

$f^{-1}(-2) = -3$

$$\Rightarrow \frac{fof^{-1}(2)+f(1)}{f^{-1}(-2)+f(0)} = \frac{2+3}{-3+2} = -5$$

Yanıt / The Answer is A

12. $f(1) = 0 \Rightarrow f(f(1)) = -2$

$f^{-1}(3) = 3$

$f^{-1}(-3) = -2$

$$\Rightarrow \frac{f(f(1))}{f^{-1}(-3)+f(3)} = \frac{-2}{3-2} = -2$$

Yanıt / The Answer is A

1. $f\left(\frac{x+1}{2}\right)=3x-4 \Rightarrow \mathbf{f(3) = ?}$

Yanıt / The Answer is: **11**

---

2. $f(3x-2) = 4x + 7,$

$f(4) = 2n + 3 \Rightarrow \mathbf{n = ?}$

Yanıt / The Answer is: **6**

---

3. $f(x, y) = 3x + y \Rightarrow \mathbf{f(-1, 3) = ?}$

Yanıt / The Answer is: **0**

---

4. $f(4x+2)=\frac{2x-1}{x+3} \Rightarrow \mathbf{f^{-1}(1) = ?}$

Yanıt / The Answer is: **18**

---

5. $f(x)=\begin{cases} \frac{3x+b}{4} & x \le 1 \\ x\cdot(x-a) & x>1 \end{cases}$

$f(3) = 6,\ f(-1) = 2 \Rightarrow \mathbf{a + b = ?}$

Yanıt / The Answer is: **12**

---

6. $f(x)=\frac{x-5}{2x+3} \Rightarrow \mathbf{f(3x) = ?}$

Yanıt / The Answer is: $\mathbf{\frac{3x-5}{6x+3}}$

7. $f(x) = 3^{2x-3} + 1 \Rightarrow \mathbf{f^{-1}(28) = ?}$

Yanıt / The Answer is: **3**

8. $f(x) = 2f(x-1) + 4,$

$f(5) = 64 \Rightarrow \mathbf{f(2) = ?}$

Yanıt / The Answer is: $\frac{9}{2}$

9. $f(x) = \begin{cases} 3x^2 + 1 & x \leq 1 \\ 4x - 7 & x > 1 \end{cases} \Rightarrow \mathbf{f(0) + f(2) = ?}$

Yanıt / The Answer is: **2**

10. $f(x) = \frac{3x+a}{x-3}$, $g(x) = x + 5,$

$fog^{-1}(3) = 2 \Rightarrow \mathbf{a = ?}$

Yanıt / The Answer is: **–4**

11. $f(x) = \begin{cases} 3x - 7 & x \leq 0 \\ x^2 + 2 & x > 0 \end{cases}$

$g(x) = 4x - 3 \Rightarrow \mathbf{fog^{-1}(5) = ?}$

Yanıt / The Answer is: **6**

12. $f : R \to R,\ f : x \to y = f(x)$

$f(x-3) = \frac{ax}{3x+1}$, $f(x) = f^{-1}(x) \Rightarrow \mathbf{f(2) = ?}$

Yanıt / The Answer is: $-\frac{25}{8}$

13. $f(2x+1) = 4x - 3$,

$2 \cdot f(x) - f(x+1) = 5 \quad \Rightarrow \quad \mathbf{x = ?}$

Yanıt / The Answer is: **6**

14. $f(x-1) = \frac{1}{3}x^2 + x - m$,

$f(2) = 4 \Rightarrow \mathbf{f(1-m) = ?}$

Yanıt / The Answer is: **–2**

15. $f(x) = \frac{2x+1}{x-1}$,

$g(x) = \frac{x+a}{2x-5}$

$(g^{-1}of)(2) = 3 \Rightarrow \mathbf{a = ?}$

Yanıt / The Answer is: **2**

16. $f(x) = 3x^2 - 5$,

$g(x) = x + 1$

$\Rightarrow \mathbf{fog^{-1}(-1) = ?}$

Yanıt / The Answer is: **7**

17. $f(x) = ax + 3$,

$g(x) = \frac{1}{2}x - a$,

$(fog)^{-1}(-3) = 2 \Rightarrow \mathbf{a_1 \cdot a_2 = ?}$

Yanıt / The Answer is: **–6**

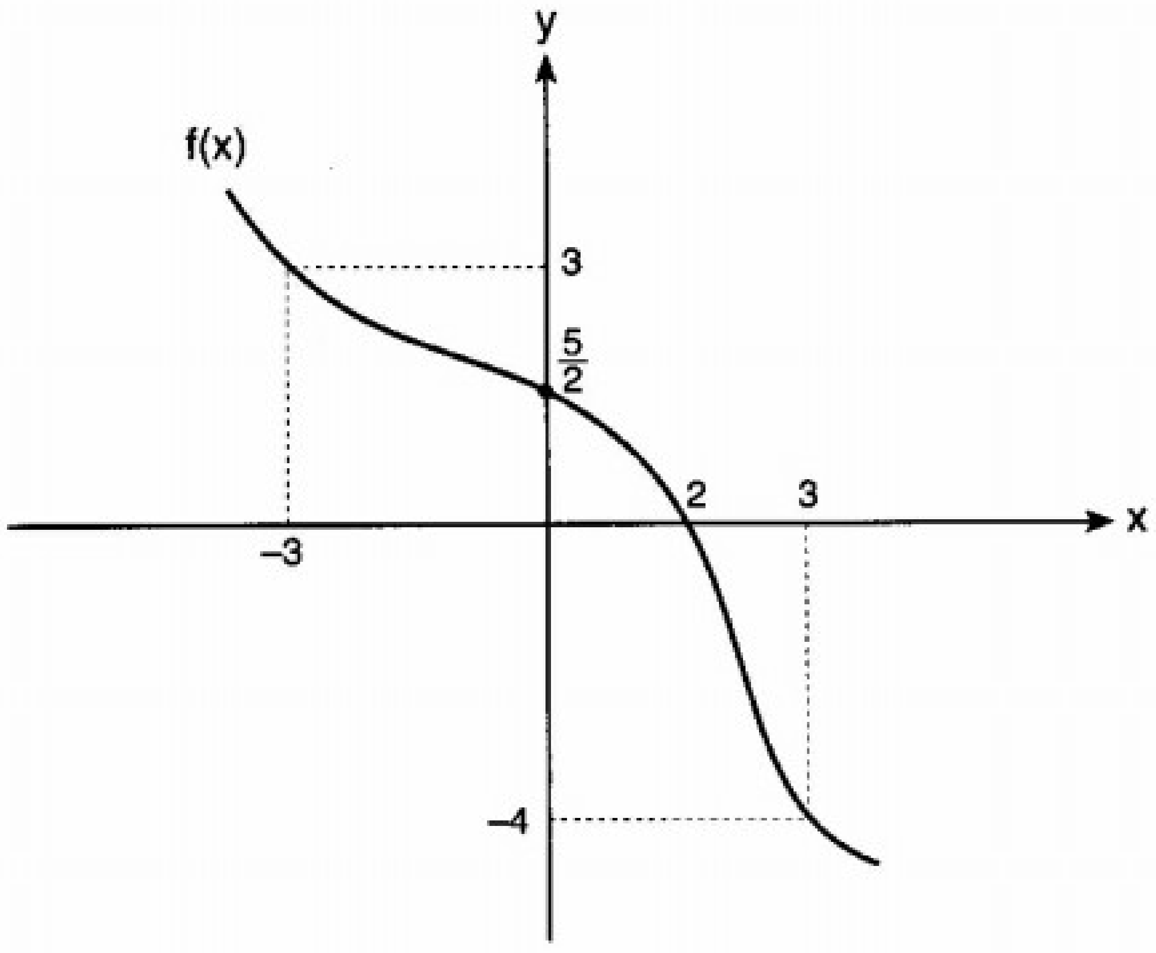
18. $f(x) = \frac{3x-a}{2x+1}$,

$g(x) = \frac{x-1}{x+1}$,

$(f^{-1}og)(3) = \frac{1}{4} \Rightarrow \mathbf{a = ?}$

Yanıt / The Answer is: **0**

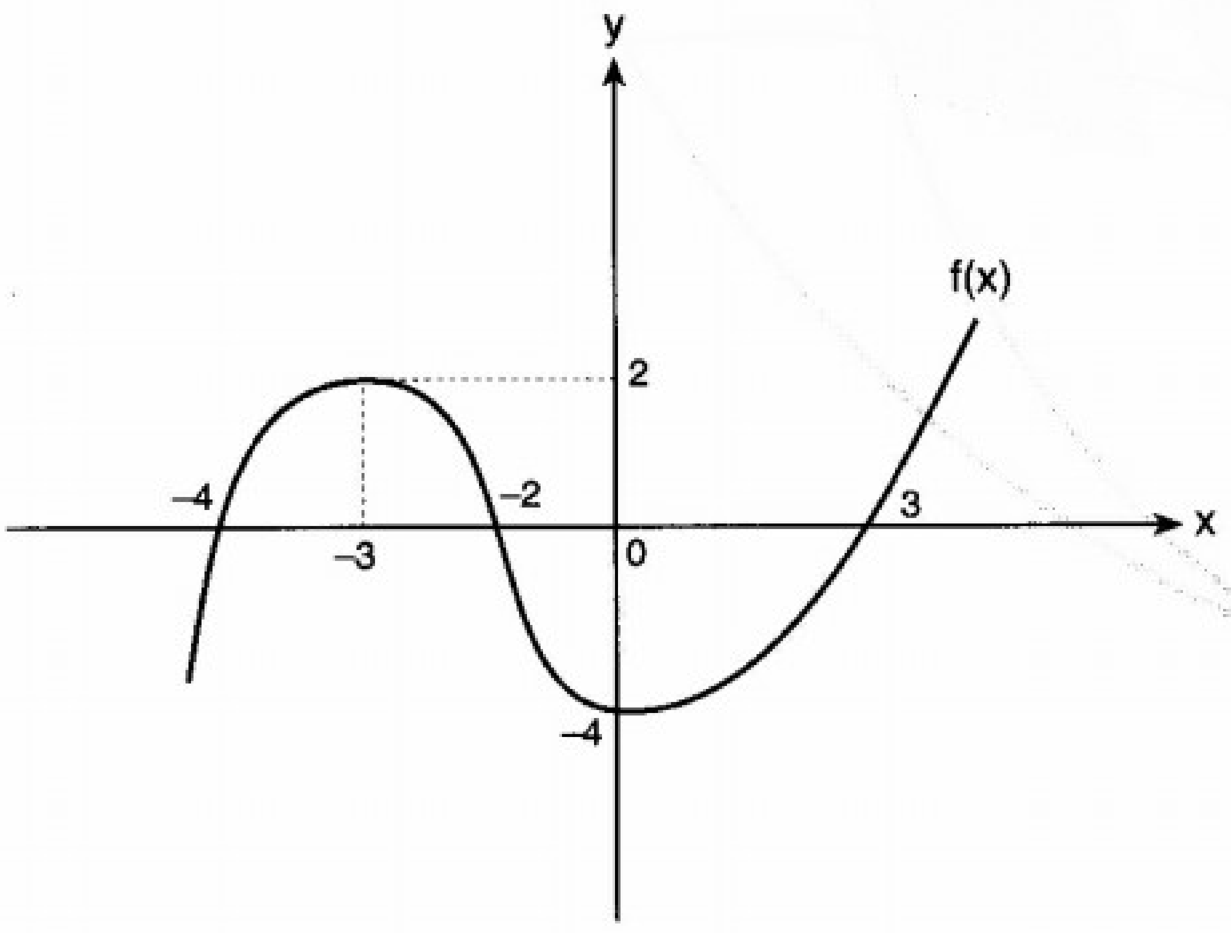
19.



$$\frac{f(-3)+f(2)}{f(3)+f(0)} = ?$$

Yanıt / The Answer is: **−2**

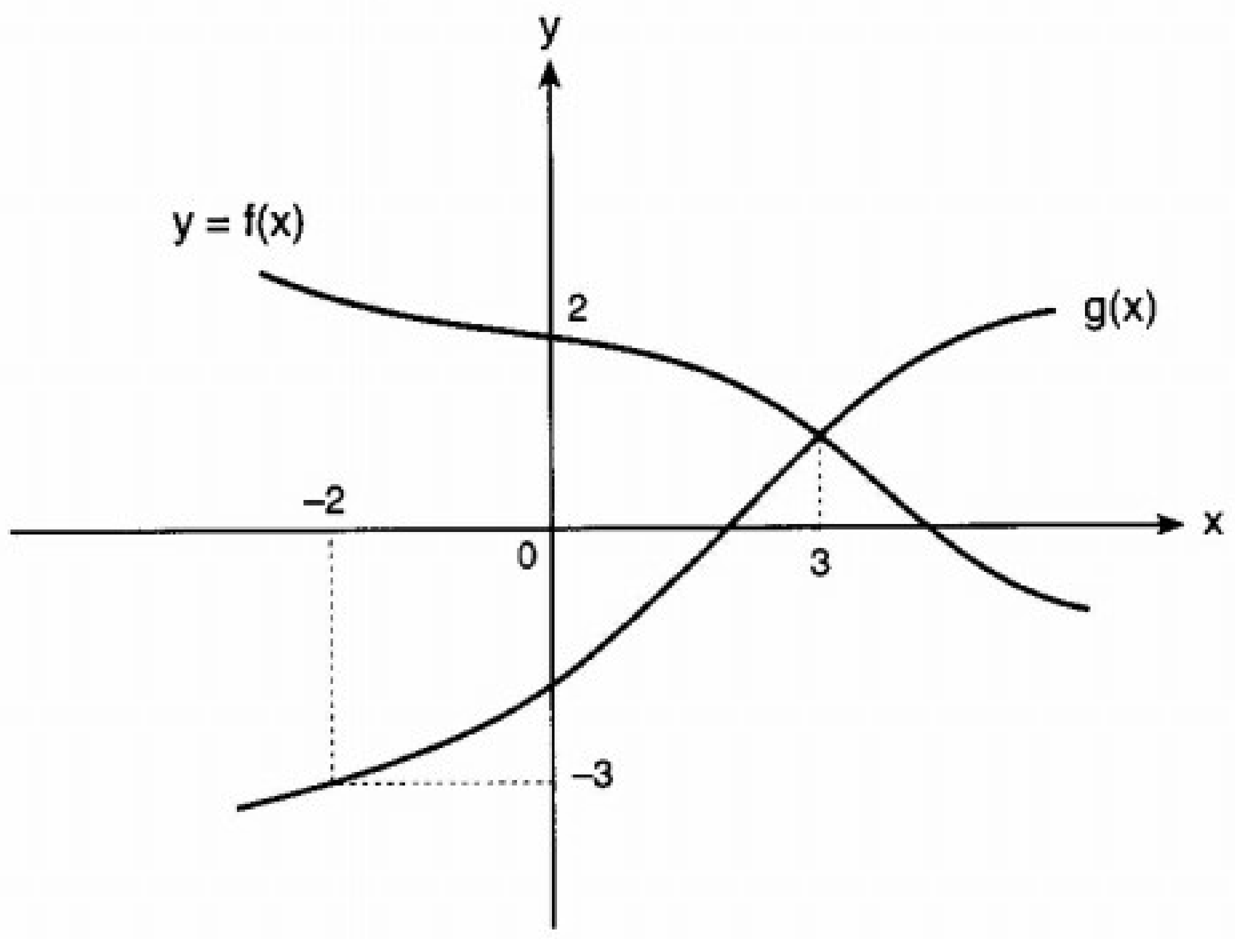
20.



$$\frac{f(3)+f(-3)}{f^{-1}(-4)+f^{-1}(2)} = ?$$

Yanıt / The Answer is: $\frac{-2}{3}$

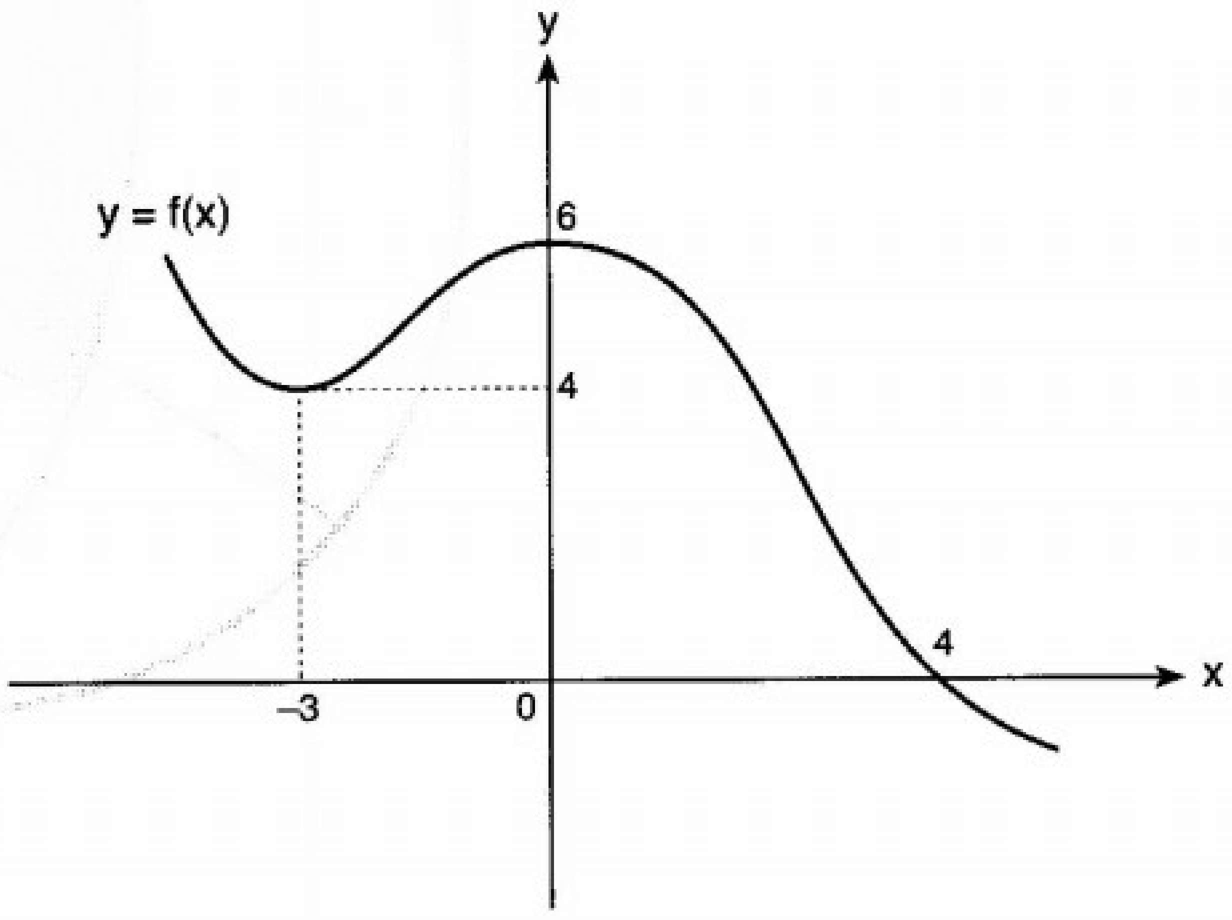
21.



$(g^{-1}of)(3) + f^{-1}(a) = -g(-2) \Rightarrow$ **$a = ?$**

Yanıt / The Answer is: **2**

22.



$(fofof)(k) = 6 \Rightarrow$ **$k = ?$**

Yanıt / The Answer is: **−3**

1. $f : A \to B$,

$f(x) = 4x - 3$,

$B = \{1, 9, 17\} \Rightarrow$ **$A = ?$**

A) $\{-2, 0, 1\}$

B) $\{3, 7, 8\}$

C) $\{2, 5, 6\}$

D) $\{3, 6, 7\}$

E) $\{1, 3, 5\}$

2. $f(x) = \begin{cases} 3x - 2 & x \le 3 \\ x + 1 & 3 < x \end{cases}$

$\Rightarrow$ **$f(-2) + f(4) = ?$**

A) -6

B) -3

C) 1

D) 2

E) 5

3. $f(x + y) = f(x) \cdot f(y)$

$f(3) = 2 \Rightarrow$ **$f(9) = ?$**

A) 2

B) 4

C) 8

D) 16

E) 32

4. $f(x - 3) = 2x + 1 \Rightarrow$ **$f^{-1}(5) = ?$**

A) -1

B) 3

C) 6

D) 8

E) 10

5. $f(4x - 3) = 2x - 5$,

$f^{-1}(1) = a + 2 \Rightarrow$ **$a = ?$**

A) 6

B) 7

C) 8

D) 9

E) 10

6. $g(x) = ax^2 + b$,

$g(2) = 11$,

$g(-1) = 2 \Rightarrow$ **$g(4) = ?$**

A) 45

B) 46

C) 47

D) 48

E) 49

7. $f(x) = 4x - 2$

$g(x) = 3x + 5 \Rightarrow$ **$fog(-1) = ?$**

A) 1

B) 3

C) 5

D) 6

E) 9

8. $f(x) = \dfrac{x+1}{x-1}$

$g(x) = 4x - 1 \Rightarrow$ **$(f^{-1}\ o\ g)^{-1}(2) = ?$**

A) –12

B) –9

C) –7

D) –3

E) 1

9. $f(x + 1) = (x - 2) \cdot f(x)$

$f(3) = 1 \Rightarrow$ **$f(50) = ?$**

A) 47!

B) 48!

C) 49!

D) 50!

E) 51!

10. $f(x) = 2x + a,$

$f(x + 2) + f(x - 1) = 4x + 8 \Rightarrow$ **$a = ?$**

A) –2

B) –1

C) 2

D) 3

E) 4

11. $f(x + 1) = 2f(x) + 1,$

$f(1) = -2 \Rightarrow$ **$f(4) = ?$**

A) –1

B) –3

C) –5

D) –7

E) –9

12. $f(x) + 2f(-x) = x^2 - 3x \Rightarrow$ **$f(1) = ?$**

A) 2

B) $\frac{8}{3}$

C) 3

D) $\frac{10}{3}$

E) $\frac{14}{3}$

YANITLAR / ANSWERS

1. E	2. B	3. C	4. A	5. B	6. C	7. D	8. E
9. B	10. D	11. E	12. D				

1. $f(x) = 4x + 5$

$$g(x) = \begin{cases} x-3 & x \geq 1 \\ x^2+1 & x < 1 \end{cases} \Rightarrow \mathbf{gof(-1) = ?}$$

A) –5 B) –4 C) –3 D) –2 E) –1

2. $f(x + 1) = 2x - 3 \Rightarrow$ **f(x) = ?**

A) 3x + 1 B) 2x – 5 C) 2x + 1 D) 4x – 3 E) 4x – 2

3. $f(x) = \dfrac{x+1}{2x-1} \Rightarrow$ **f(2x) = ?**

A) $\dfrac{4f(x)+1}{2f(x)+5}$ B) $\dfrac{3f(x)+1}{2f(x)-3}$ C) $\dfrac{2f(x)-1}{4f(x)+2}$ D) $\dfrac{3f(x)+4}{2f(x)-3}$ E) $\dfrac{4f(x)+3}{2f(x)-4}$

4. $f(x) = ax + b$

$f(1) = 1,\ f^{-1}(7) = 3 \Rightarrow$ **a – b = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

5. $f(x) = 3x + a,\ (g^{-1}of)^{-1}(x) = \dfrac{x+2}{2x-1}$

$g(1) = 8 \Rightarrow$ **a = ?**

A) –8 B) –6 C) –4 D) –2 E) –1

6. $f(x) = 3x - 2$,

$g(x) = 4x + 1$

$h(x) = x^2 - 2 \Rightarrow$ **fogoh(–1) = ?**

A) –15 B) –13 C) –11 D) –9 E) –7

7. $f(x) = x - 1$, $gof(x) = x^2 - 2 \Rightarrow$ **$g(x) = ?$**

A) $x^2 + x + 3$
B) $x^2 + 3x - 1$
C) $x^2 - 2x + 3$
D) $x^2 + 2x - 1$
E) $x^2 + x - 5$

8. $f(x) = \dfrac{x-1}{2x+3}$

$(g^{-1}of)^{-1}(x) = x^2 + 2 \Rightarrow$ **$g(1) = ?$**

A) $\frac{1}{9}$
B) $\frac{2}{9}$
C) $\frac{4}{9}$
D) $\frac{5}{9}$
E) $\frac{7}{9}$

9. $g(x) = \dfrac{3x-2}{x+1}$ $\quad fog(x) = x \Rightarrow$ **$f(-2) = ?$**

A) -1
B) 0
C) 1
D) 2
E) 3

10. $a > 0$,

$f(x) = 2x^2 + 1$, $g(x) = 4 - x$,

$gof(a) = -15 \Rightarrow$ **$a = ?$**

A) 3
B) 4
C) 5
D) 6
E) 7

11. $f(x) = 2^{x+1} \Rightarrow$ **$f(2x) = ?$**

A) $2f^2(x)$
B) $f^2(x)$
C) $\frac{f^2(x)}{2}$
D) $\frac{f^2(x)}{4}$
E) $\frac{f^2(x)}{8}$

12. $f: R - \{a\} \rightarrow R - \{b\}$,

$f(x) = \dfrac{x+4}{3x+6} \Rightarrow$ **$a + b = ?$**

A) $-\frac{5}{3}$
B) $-\frac{4}{3}$
C) -1
D) $-\frac{2}{3}$
E) $-\frac{1}{3}$

YANITLAR / ANSWERS							
1. D	**2. B**	**3. A**	**4. E**	**5. E**	**6. C**	**7. D**	**8. B**
9. B	**10. A**	**11. C**	**12. A**				

1. $f(x+1) = 2 \cdot f(x) + 3x$,

$f(1) = -2 \Rightarrow$ **$f(5) = ?$**

A) 38
B) 41
C) 44
D) 46
E) 48

2. $f(2^{3x+2}) = 9x^2 - 3x + 5 \Rightarrow$ **$f(8) = ?$**

A) 4
B) 5
C) 8
D) 12
E) 16

3. $[f(x)]^2 - 4x \cdot f(x) + 3 = 0$

$\Rightarrow$ **$f^{-1}(3) = ?$**

A) 1
B) 2
C) 3
D) 4
E) 5

4. $f(x) = x^3 - 2x^2 + ax + 4$

$f^{-1}(14) = 2 \Rightarrow$ **$a = ?$**

A) 5
B) 8
C) 9
D) 12
E) 14

5. $f \circ f^{-1}(4x+7) = 15 \Rightarrow$ **$x = ?$**

A) –2
B) –1
C) 0
D) 1
E) 2

6. $f(2x+1) = \dfrac{x-3}{x+4} \Rightarrow$ **$f(x) = ?$**

A) $\dfrac{x+3}{x-2}$
B) $\dfrac{x-7}{x+7}$
C) $\dfrac{x-5}{x+4}$
D) $\dfrac{x-6}{x+1}$
E) $\dfrac{x+8}{x-2}$

7. $f(x^2-4x)=5x^2-20x+3 \Rightarrow$ **$f^{-1}(13)=?$**

A) –8 B) –6 C) –4 D) –1 E) 2

8. $2^{f(x)}=x+7 \Rightarrow$ **$f(1)+f(25)=?$**

A) 2 B) 4 C) 6 D) 8 E) 10

9. $f(x+1)=f(x)+4$

$f(1)=2 \Rightarrow$ **$f(20)=?$**

A) 76 B) 77 C) 78 D) 79 E) 80

10. $(fog^{-1})^{-1}(x)=\dfrac{2x+1}{3x-2}$

$f(x)=4x+5 \Rightarrow$ **$g^{-1}(3)=?$**

A) –3 B) –2 C) –1 D) 0 E) 1

11. $f(x)=ax+b,$

$f(3)=5$

$f^{-1}(9)=5 \Rightarrow$ **$f(2)=?$**

A) –8 B) –6 C) –5 D) –1 E) 3

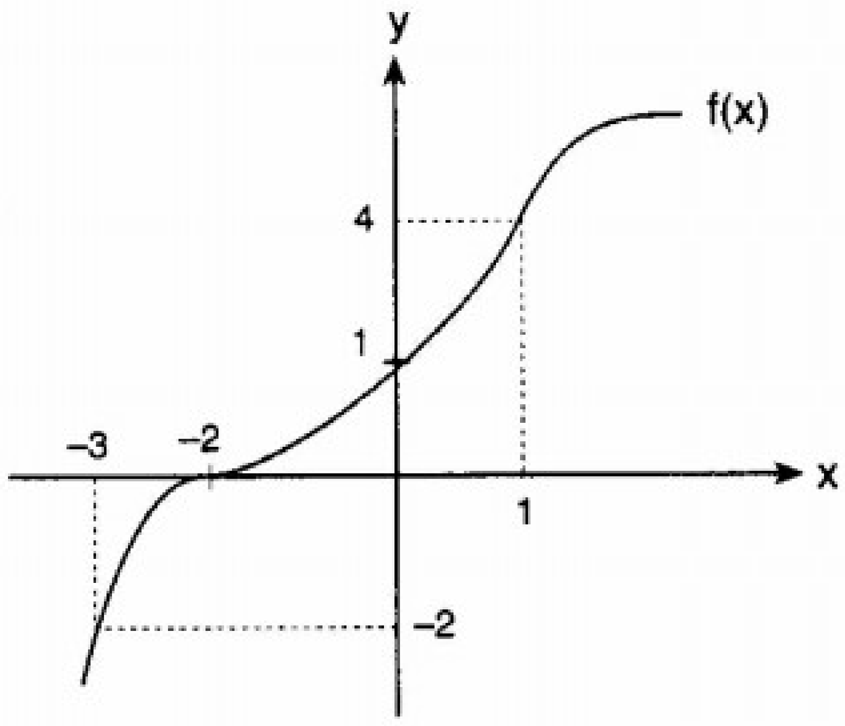
12. $f\left(\dfrac{6}{x}\right)+2\cdot f\left(\dfrac{x}{6}\right)=3x \Rightarrow$ **$f(3)=?$**

A) 24 B) 27 C) 30 D) 34 E) 36

YANITLAR / ANSWERS

1. D	2. B	3. A	4. A	5. E	6. B	7. E	8. D
9. C	10. C	11. E	12. D				

1. $\dfrac{f(0)+f^{-1}(-2)}{f(1)+f^{-1}(0)}=?$



A) –1 B) 0 C) 1 D) 2 E) 3

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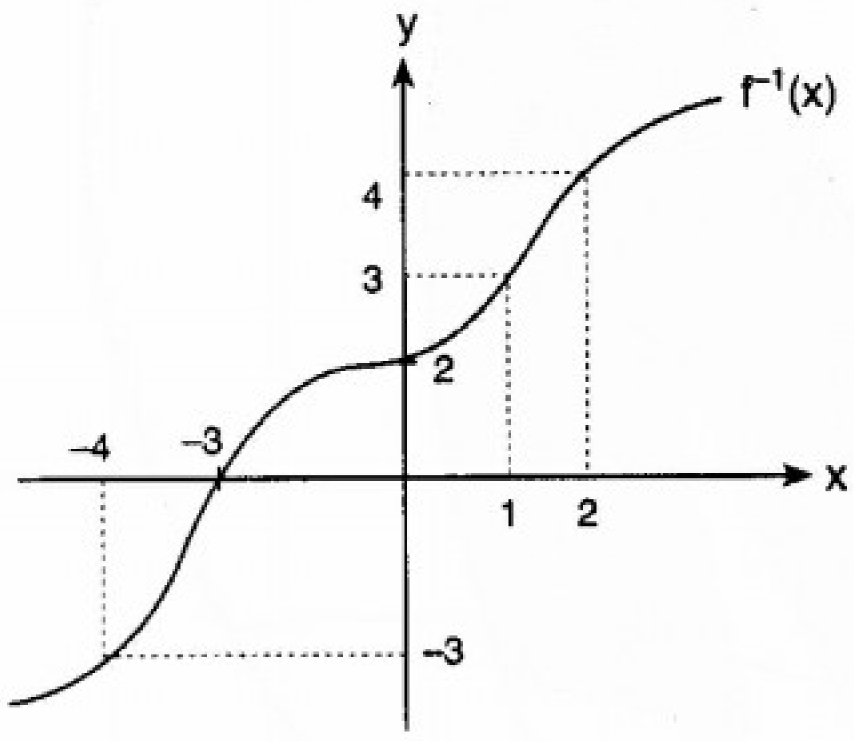
2. $fof(2) = ?$



A) –4 B) –3 C) 0 D) 1 E) 2

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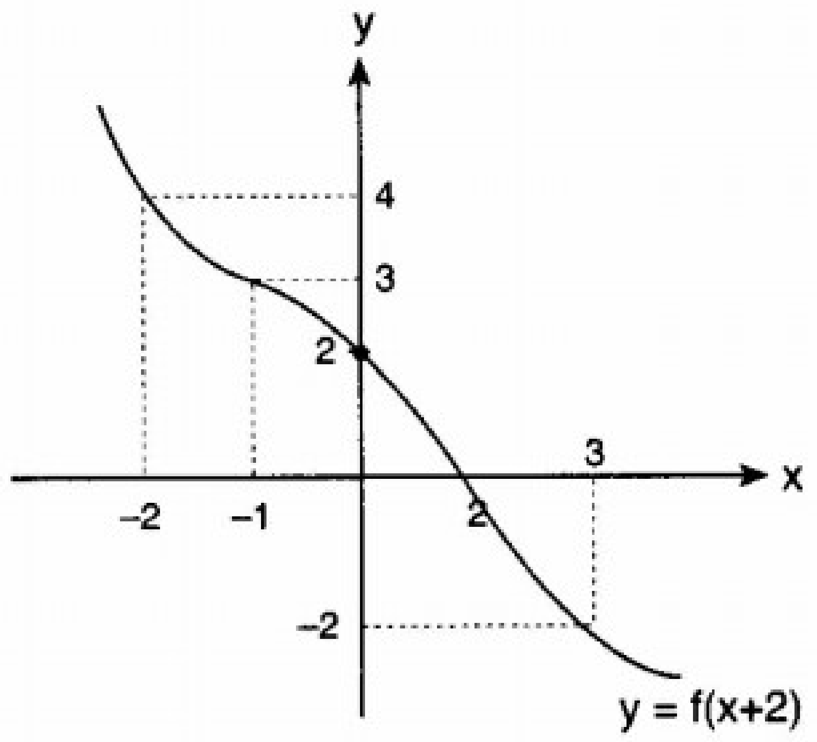
3. $\dfrac{f(1)+f(5)}{f^{-1}(2)+f^{-1}(4)}=?$



A) $-\dfrac{1}{2}$ B) 0 C) $\dfrac{1}{2}$ D) 1 E) $\dfrac{3}{2}$

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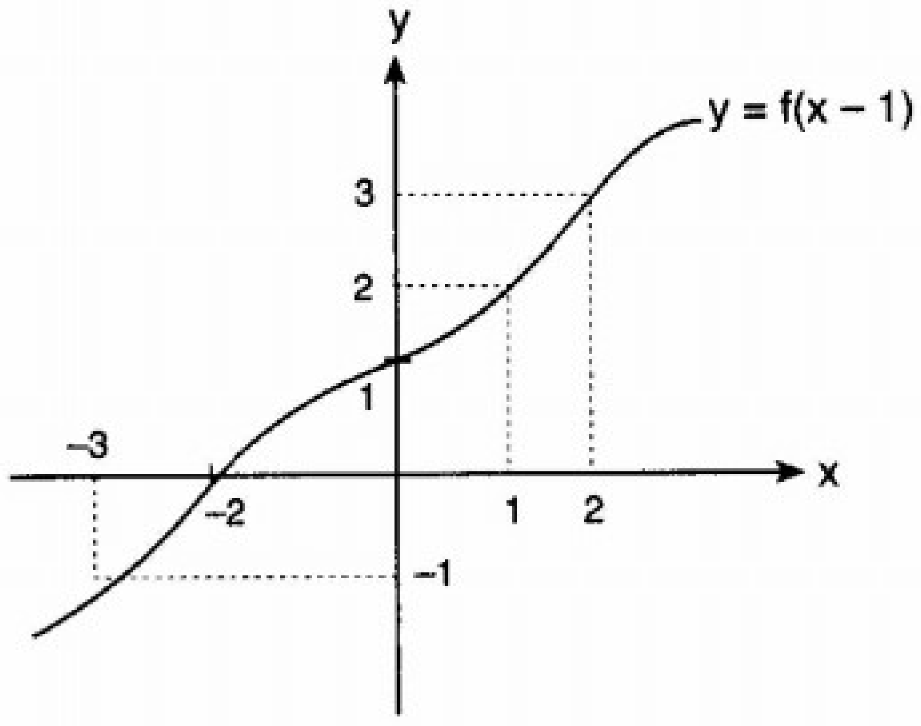
4. $\dfrac{f(-4)+f^{-1}(3)}{f(0)+f^{-1}(2)}=?$

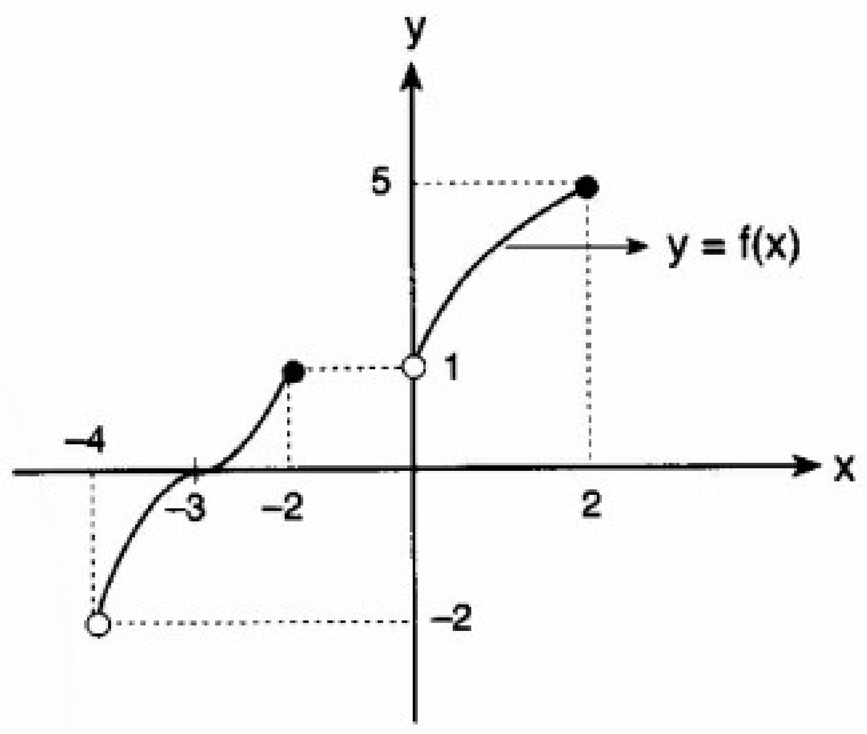


A) –2 B) –1 C) 0 D) 1 E) 2

---

5. $f : A \to B$

$\Rightarrow$ **B = ?**



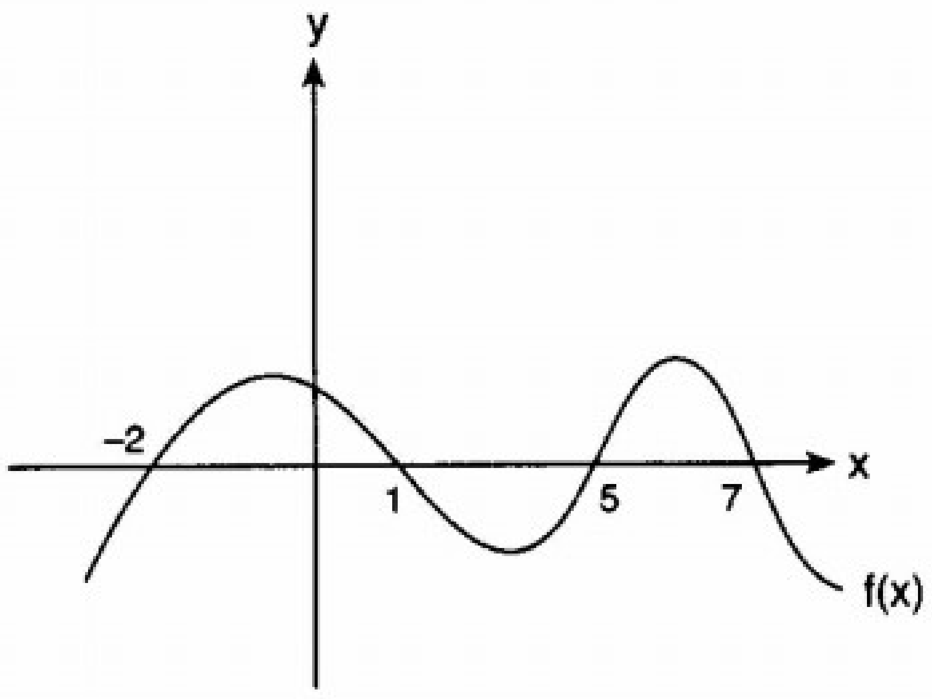
A) (–4, 5] B) (–2, 5] C) [–4, 2] D) [–3, 1) E) (–2, 2)

---

6. $x \in Z$,

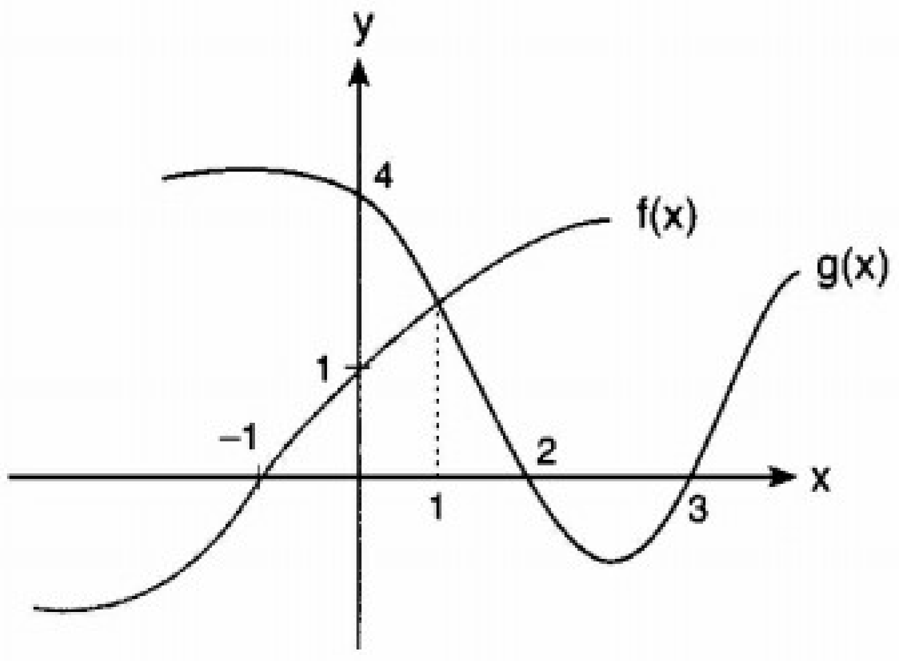
$f(x) > 0$

$\Rightarrow \sum x = ?$



A) 3 B) 5 C) 7 D) 8 E) 9

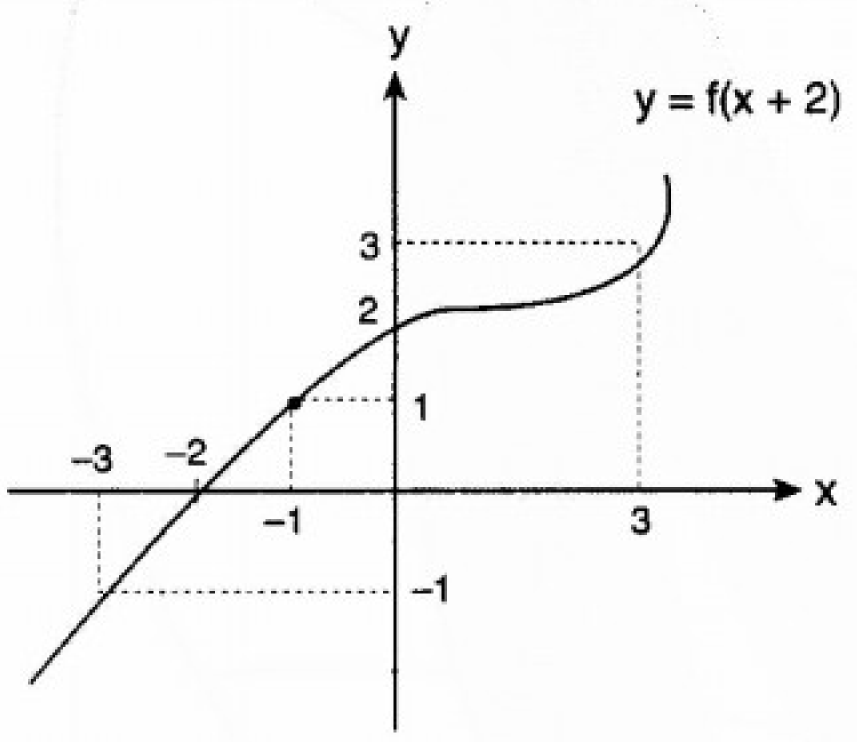
7.



$f^{-1}og(1) + fog(2) = ?$

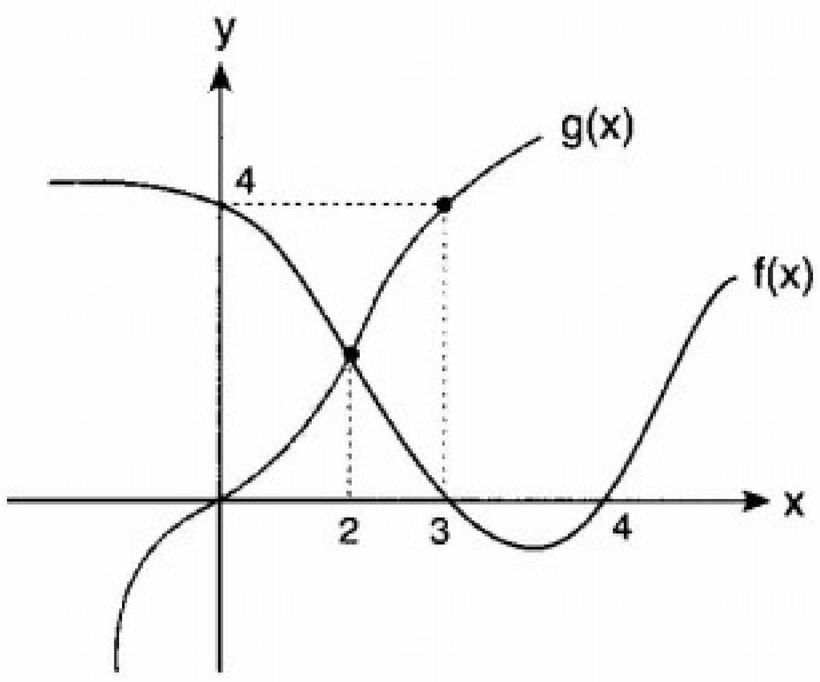
A) 2
B) 3
C) 5
D) 7
E) 8

8. $fof(0) = ?$



A) –1
B) 0
C) 1
D) 2
E) 3

9.



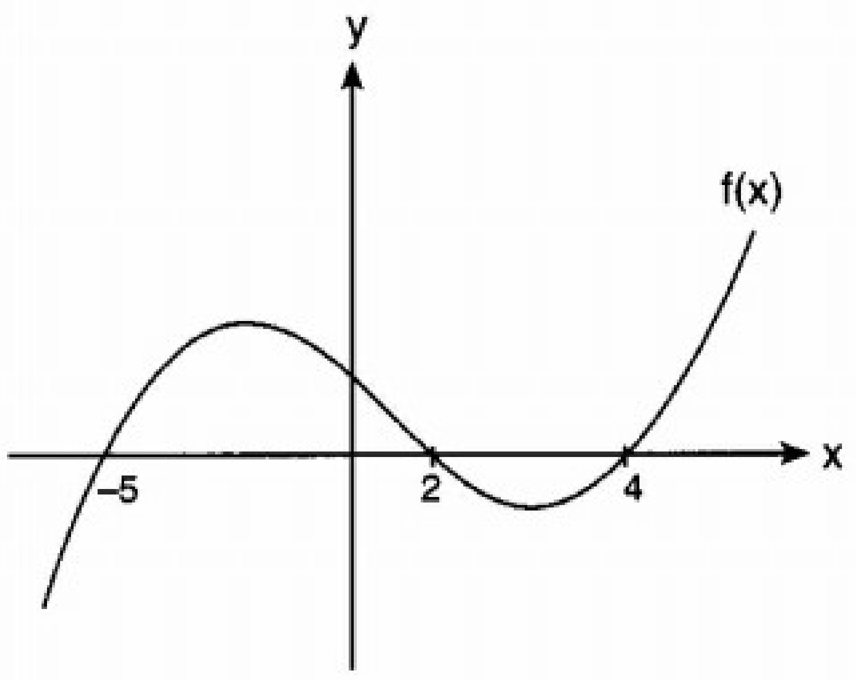
$g^{-1}of(2) + fog(3) = ?$

A) –1
B) 1
C) 2
D) 4
E) 5

10. $x \in Z$,

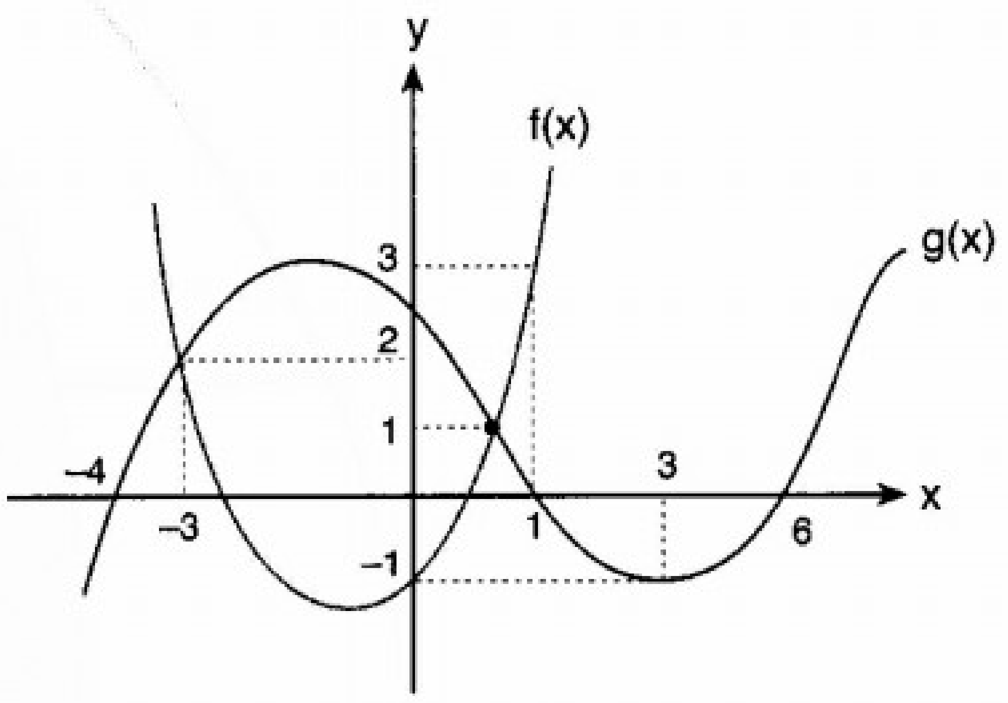
$x \cdot f(x) < 0$

$\Rightarrow \sum x = ?$



A) –1
B) –2
C) –3
D) –5
E) –7

11.



$gof(1) + fog^{-1}(1) = ?$

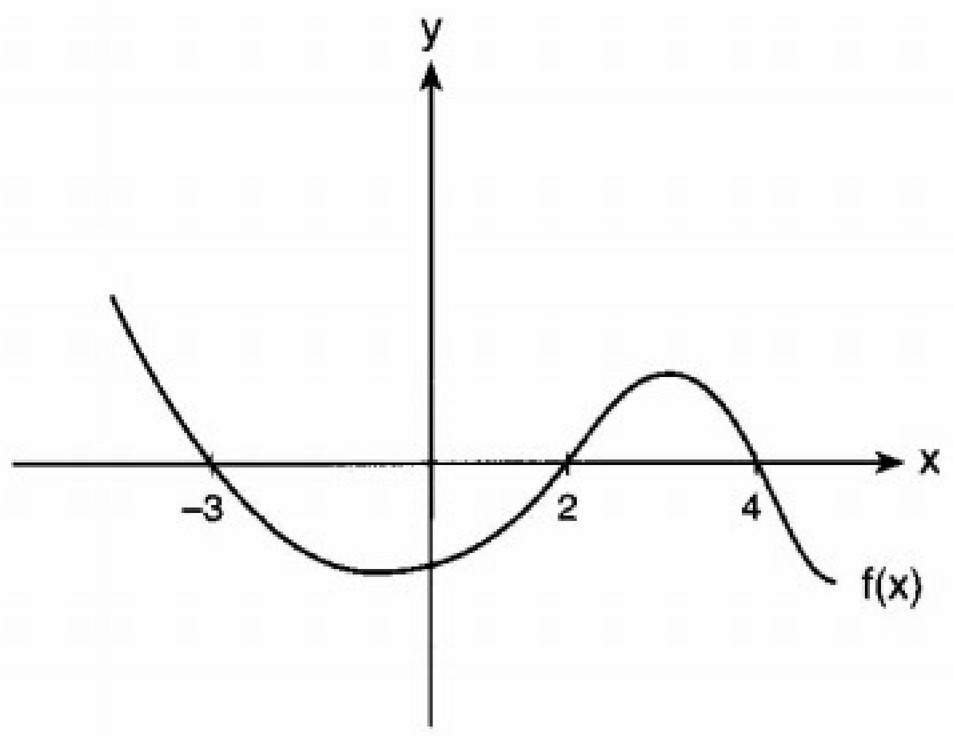
A) –3
B) –2
C) –1
D) 0
E) 1

12. $x \in Z$,

$x \cdot f(x) > 0$

$\Rightarrow \sum x = ?$

A) –5
B) –3
C) 0
D) 3
E) 5



YANITLAR / ANSWERS

1. A	2. B	3. C	4. C	5. B	6. B	7. A	8. B
9. C	10. E	11. D	12. C				

1. $\frac{3}{x\Delta y}=\frac{1}{x}+\frac{2}{y} \Rightarrow \mathbf{2\,\Delta\,3 = ?}$

A) $\frac{10}{7}$

B) $\frac{12}{7}$

C) 2

D) $\frac{16}{7}$

E) $\frac{18}{7}$

2. $(2x + y) \square (x - y) = 4x - y \Rightarrow \mathbf{4 \square (-1) = ?}$

A) –1

B) 0

C) 1

D) 2

E) 3

3. $x\,\Delta\,y = 3x - y + 2(y\,\Delta\,x) \Rightarrow \mathbf{2\,\Delta\,1 = ?}$

A) $-\frac{5}{3}$

B) –2

C) $-\frac{7}{3}$

D) $-\frac{8}{3}$

E) –3

4. $x \star y = \max(3x + y,\ 2x - y)$,

$x \square y = \min(x^y,\ 3x + y)$

$\Rightarrow \mathbf{(2 \star 1) \square 3 = ?}$

A) 15

B) 17

C) 20

D) 24

E) 26

5. $a \square b = (3a - b,\ 2a + b)$,

$(a, b)\,\Delta\,(c, d) = a{\cdot}b + cd$

$\Rightarrow \mathbf{(3 \square -1)\,\Delta\,(-1 \square 2) = ?}$

A) 47

B) 48

C) 49

D) 50

E) 51

6. $\mathbf{(2\,\Delta\,1)\,\Delta\,(4\,\Delta\,5) = ?}$

Δ	1	2	3	4	5
1	4	5	1	2	3
2	5	1	2	3	4
3	1	2	3	4	5
4	2	3	4	5	1
5	3	4	5	1	2

A) 1

B) 2

C) 3

D) 4

E) 5

7.

$$\begin{array}{r|l} A & 5 \\ \cline{2-2} - & B \\ \hline 2 & \end{array} \qquad \begin{array}{r|l} B & 2 \\ \cline{2-2} - & \\ \hline 1 & \end{array}$$

$A \equiv x \pmod{10} \Rightarrow$ **$x = ?$**

A) 3

B) 4

C) 5

D) 6

E) 7

8. $1! + 2! + \ldots + 55! \equiv x \pmod{5} \Rightarrow$ **$x = ?$**

A) 0

B) 1

C) 2

D) 3

E) 4

9. $12! - 8! \equiv x \pmod{7} \Rightarrow$ **$x = ?$**

A) 0

B) 1

C) 2

D) 3

E) 4

10. $3^{18} \equiv x \pmod{8} \Rightarrow$ **$x = ?$**

A) 1

B) 2

C) 4

D) 5

E) 7

11.

$$\left.\begin{array}{l} -17 \equiv x \pmod{4} \\ 71 \equiv y \pmod{6} \end{array}\right\} \Rightarrow \mathbf{x + y = ?}$$

A) 3

B) 4

C) 6

D) 8

E) 9

12. $-\dfrac{2}{3} \equiv x \pmod{5} \Rightarrow$ **$x = ?$**

A) 0

B) 1

C) 2

D) 3

E) 4

YANITLAR / ANSWERS							
1. E	2. D	3. C	4. D	5. D	6. C	7. E	8. D
9. A	10. A	11. D	12. B				

1. $x = 2,\ y = 3 \Rightarrow \dfrac{3}{2\Delta 3} = \dfrac{1}{\underset{(3)}{2}} + \dfrac{2}{\underset{(2)}{3}}$

$$\frac{3}{2\Delta 3} = \frac{7}{6}$$

$$18 = 7(2\Delta 3)$$

$$2\Delta 3 = \frac{18}{7}$$

Yanıt / The answer is E

2. $2x + y = 4$

$+\ x - y = -1$

$3x = 3$

$x = 1 \Rightarrow y = 2$

$\Rightarrow 4 \square (-1) = 4\cdot 1 - 2 = 2$

Yanıt / The answer is D

3. $x \Delta y = 3x - y + 2(y \Delta x)$

$2 \Delta 1 = 6 - 1 + 2(1 \Delta 2)$

$1 \Delta 2 = 3 - 2 + 2(2 \Delta 1)$

$2 \Delta 1 = 5 + 2\,(1 \Delta 2)$

$= 5 + 2\,(1 + 2(2 \Delta 1))$

$2 \Delta 1 = 5 + 2\ + 4(2 \Delta 1)$

$-3(2 \Delta 1) = 7 \Rightarrow 2 \Delta 1 = -\dfrac{7}{3}$

Yanıt / The answer is C

4. $2 \bigstar 1 = \max(3\cdot 2 + 1,\ 2\cdot 2 - 1),$

$= \max(7, 3) = 7$

$7 \square 3 = \min(7^3, 24) = 24$

Yanıt / The answer is D

5. $3 \square -1 = (3\cdot 3 + 1,\ 2\cdot 3 - 1) = (10, 5)$

$-1 \square 2 = (-3 - 2,\ -2 + 2) = (-5, 0)$

$\Rightarrow (10, 5)\ \Delta\ (-5, 0) = 10\cdot 5 + 0 = 50$

Yanıt / The answer is D

6. $2 \Delta 1 = 5$

$4 \Delta 5 = 1$

$\Rightarrow (2 \Delta 1)\ \Delta\ (4 \Delta 5) = 5 \Delta 1 = 3$

Yanıt / The answer is C

7.

$$\begin{array}{r|l} A & 5 \\ \cline{2-2} - & B \\ \hline 2 & \end{array} \qquad \begin{array}{r|l} B & 2 \\ \cline{2-2} - & C \\ \hline 1 & \end{array}$$

$\Rightarrow A = 5B + 2, \; B = 2C + 1$

$A = 5(2C + 1) + 2 = 10C + 7$

$\Rightarrow A \equiv 7 \pmod{10}$

Yanıt / The answer is E

---

8. $1! = 1$

$2! = 1 \cdot 2 = 2$

$3! = 1 \cdot 2 \cdot 3 = 6$

$4! = 1 \cdot 2 \cdot 3 \cdot 4 = 24$

$5! = 1 \cdot 2 \cdot 3 \cdot 4 \cdot 5 = 120 \equiv 0 \pmod 5$

$6! = 6 \cdot 5! \equiv 0 \pmod 5$

$\vdots$

$\Rightarrow 1 + 2 + 6 + 24 + 0 + 0 + \ldots + 0 \equiv x \pmod 5$

$33 \equiv x \pmod 5$

$$\begin{array}{r|l} 33 & 5 \\ \cline{2-2} - & 6 \\ \hline \textcircled{3} \longrightarrow x & \end{array}$$

Yanıt / The answer is D

---

9. $8! = 8 \cdot 7! \equiv 0 \pmod 7$

$\Rightarrow x = 0$

Yanıt / The answer is A

---

10. $3^1 \equiv 3 \pmod 8$

$3^2 \equiv 1 \pmod 8$

$$\begin{array}{r|l} 18 & 2 \\ \cline{2-2} -\,18 & 9 \\ \hline \textcircled{0} \longrightarrow 3^0 = 1 = x & \end{array}$$

Yanıt / The answer is A

11.

$$\begin{array}{r|l} 17 & 4 \\ \cline{2-2} -\,16 & 4 \\ \hline 1 & \end{array} \quad \Rightarrow \quad x = -1 + 4 = 3$$

$$\begin{array}{r|l} 71 & 6 \\ \cline{2-2} -\,66 & 11 \\ \hline \textcircled{5} \longrightarrow y & \end{array}$$

$x + y = 3 + 5 = 8$

Yanıt / The answer is D

---

12. $Z_{/5}$,

$-\frac{2}{3} \equiv \frac{-2+5}{3} = \frac{3}{3} = 1$

$\Rightarrow -\frac{2}{3} \equiv 1 \pmod 5$

Yanıt / The answer is B

1. $\frac{3}{a \bigcirc b} = \frac{2}{a} + \frac{5}{b} \Rightarrow \mathbf{3 \bigcirc 2 = ?}$

Yanıt / The Answer is: $\mathbf{\frac{18}{19}}$

2. $x \star y = x^y + y \Rightarrow \mathbf{(2 \star (-1)) \star 2 = ?}$

Yanıt / The Answer is: $\mathbf{\frac{9}{4}}$

3. $a \;\text{✿}\; b = \begin{cases} 2a - b & a \cdot b > 0 \\ a + 3b & a \cdot b \leq 0 \end{cases}$

$\Rightarrow \mathbf{(1 \;\text{✿}\; 0) \;\text{✿}\; (2 \;\text{✿}\; -1) = ?}$

Yanıt / The Answer is: **−2**

4. $\left.\begin{array}{l} a \star b = 4a + b - 3 \\ a \square b = 2a - b + 1 \end{array}\right\} \Rightarrow \mathbf{(3 \star 2) \square (-2 \star 1) = ?}$

Yanıt / The Answer is: **33**

5. $a \square b = 3a - b + 2$

$a \star b = a \cdot b - 4$

$(2 \square -1) \star x = 41 \Rightarrow \mathbf{x = ?}$

Yanıt / The Answer is: **5**

6. $a \,\Delta\, b = \max(a - 2b, a + b)$

$a \star b = \min(4 - a + b, a^b) \Rightarrow \mathbf{(2 \,\Delta\, -1) \star (3 \,\Delta\, 0) = ?}$

Yanıt / The Answer is: **3**

7. $\left.\begin{array}{l} 213 \equiv x \pmod 4 \\ -35 \equiv y \pmod 8 \end{array}\right\} \Rightarrow \mathbf{x + y = ?}$

Yanıt / The Answer is: **6**

8. $4x - 3 \equiv x + 3 \pmod 6 \Rightarrow \mathbf{x = ?}$

Yanıt / The Answer is: **2**

9. $3x - 2 \equiv x + 5 \pmod 7 \Rightarrow \mathbf{x = ?}$

Yanıt / The Answer is: **0**

10. $x < 100$,

$x \equiv 3 \pmod 5 \Rightarrow \mathbf{max(x) = ?}$

Yanıt / The Answer is: **98**

11. $50 < x$,

$12 \equiv x \pmod 7 \Rightarrow \mathbf{min(x) = ?}$

Yanıt / The Answer is: **54**

12. $2^{25} \equiv x \pmod 7 \Rightarrow \mathbf{x = ?}$

Yanıt / The Answer is: **2**

1. $x \Delta y = 2x + 3y - 2$

$(2 \Delta m) \Delta 1 = -13 \Rightarrow$ **$m = ?$**

A) –9

B) –7

C) –6

D) –5

E) –3

2. $(x + y) \Delta (x - y) = 2x + y - 2 \Rightarrow$ **$3 \Delta 5 = ?$**

A) 1

B) 2

C) 3

D) 4

E) 5

3. $a \Delta b = 3a + 2b + 2(b \Delta a) \Rightarrow$ **$3 \Delta 1 = ?$**

A) $-\frac{28}{3}$

B) $-\frac{29}{3}$

C) –10

D) $-\frac{31}{3}$

E) $-\frac{32}{3}$

4. $a \Delta b = 3a - 2b$, $(3 \Delta 2) \Delta x = 19 \Rightarrow$ **$x = ?$**

A) –8

B) –7

C) –4

D) –2

E) –1

5. a ★ b = 2a – b + 3

⇒ **(1 ❑ 2) ★ (4 ❑ 3) = ?**

A) –2

B) 1

C) 3

D) 6

E) 8

❑	1	2	3	4	5
1	1	2	3	4	5
2	2	3	4	5	1
3	3	4	5	1	2
4	4	5	1	2	3
5	5	1	2	3	4

6. $(1 \Delta x) \Delta (b \Delta 2) = a$

$\Rightarrow$ **$x = ?$**

A) 1

B) 2

C) a

D) b

E) c

Δ	1	2	a	b	c
1	b	c	1	2	a
2	c	1	2	a	b
a	1	2	a	b	c
b	2	a	b	c	1
c	a	b	c	1	2

7. $\left.\begin{aligned} x+y &\equiv 3 \pmod 6 \\ x-y &\equiv 5 \pmod 6 \end{aligned}\right\} \Rightarrow \mathbf{x \cdot y \equiv\ ?\ (mod\ 6)}$

A) 1
B) 2
C) 3
D) 4
E) 5

8. $2! + 4! + \ldots + 30! \equiv x \pmod 7 \Rightarrow$ **$x = ?$**

A) 2
B) 3
C) 4
D) 5
E) 6

9. $1! + 3! + \ldots + 81! \equiv x \pmod{15} \Rightarrow$ **$x = ?$**

A) 3
B) 4
C) 5
D) 6
E) 7

10. $4x + 3 = x - 2 \pmod 7 \Rightarrow$ **$x = ?$**

A) 1
B) 2
C) 3
D) 4
E) 5

11. $x < 80$,
$21 \equiv x \pmod 4 \Rightarrow$ **$\max(x) = ?$**

A) 75
B) 76
C) 77
D) 78
E) 79

12. $3^{52} \equiv x \pmod 6 \Rightarrow$ **$x = ?$**

A) 1
B) 2
C) 3
D) 4
E) 5

YANITLAR / ANSWERS

1. E	**2. E**	**3. B**	**4. D**	**5. D**	**6. E**	**7. B**	**8. C**
9. E	**10. C**	**11. C**	**12. C**				

ÜNİTE 6

UNIT

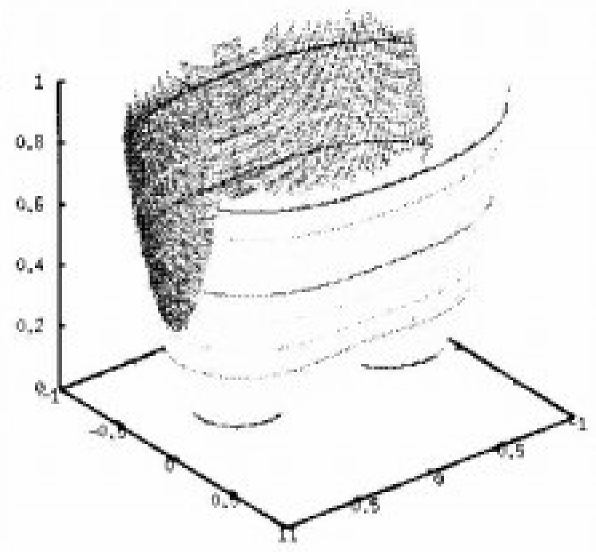
Polinomlar, ikinci dereceden denklemler, eşitsizlikler ve fonksiyonlar bu ünitede ayrıntılı anlatılmıştır. Polinom, fonksiyonun özel durumudur. Bu nedenle, fonksiyonları iyi öğrendiyseniz, polinomlarda zorlanmazsınız. Benzer şekilde, ikinci dereceden denklemler, eşitsizlikler ve fonksiyonlar, birinci dereceden denklem ve eşitsizliklerin genelleştirilmiş halidir. Ayrıca çarpanlara ayırma konusuna, ikinci dereceden denklemler konusunda kısaca değinilmiştir.

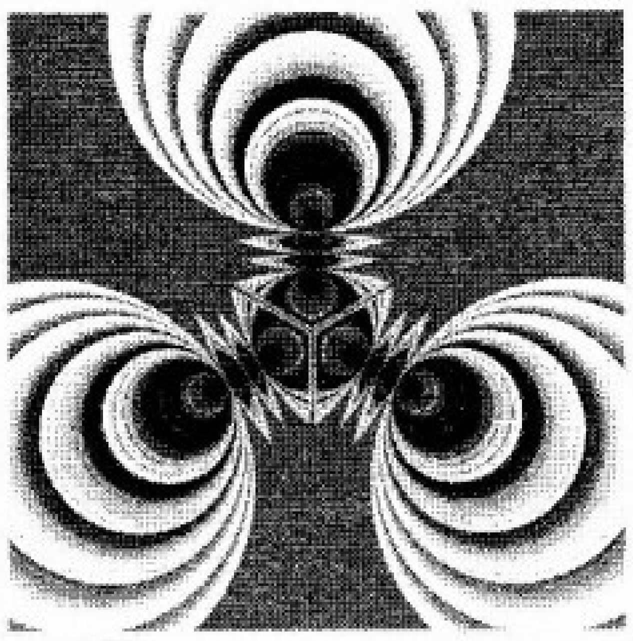
Bu ünite; 111 çözümlü örnek, 48 alıştırma, ve 108 test sorusundan oluşmaktadır.

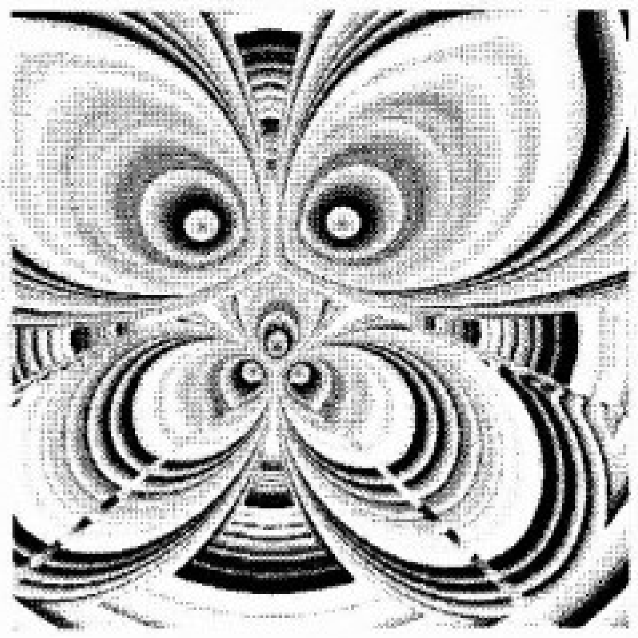
$ax^2+bx+c=0$
$x=\frac{-b\pm\sqrt{b^2-4ac}}{2a}$

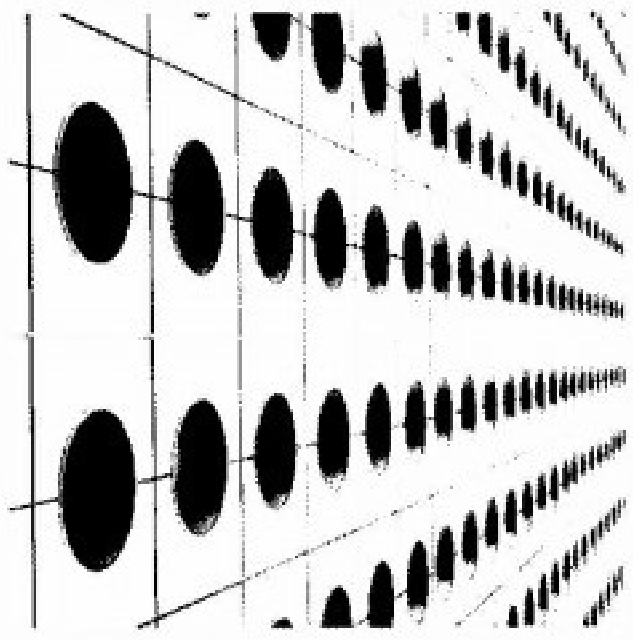
In this unit, polynomials, quadratic equations, inequalities and functions are explained in detailed. Polynomial is special situation of function. Moreover, if you learned functions, polynomials are very easy. Similarly, quadratic equations, inequalities and functions are generalized of the first order equations, inequalities. Also factorization is explanation shortly in quadratic equation.

This unit includes; 108 test questions.









◆ **POLİNOMLAR / *POLYNOMIALS*** .... 333 – 354

◆ **İKİNCİ DERECEDEN DENKLEMLER**
QUADRATIC EQUATIONS .... 355 – 376

◆ **İKİNCİ DERECEDEN EŞİTSİZLİKLER**
QUADRATIC INEQUALITIES .... 377 – 392

◆ **İKİNCİ DERECEDEN FONKSİYONLAR**
QUADRATIC FUNCTIONS .... 393 – 414

1. $(x+3)\cdot P(x) = 2x^2 - x + a \Rightarrow \mathbf{P(-2) = ?}$

A) –20 B) –15 C) –12

D) –11 E) –8

---

2. $P(x-2) = 3x^2 - 2x + 3,$

$$\begin{array}{r|l} P(x) & x+1 \\ \cline{2-2} - & \\ \hline K(x) & \end{array} \Rightarrow \mathbf{K(x) = ?}$$

A) –2 B) 0 C) 1

D) 3 E) 4

---

3. $P(x) = 2x^3 + mx - 2,$

$$\begin{array}{r|l} P(x) & x^2+x \\ \cline{2-2} - & \\ \hline 6x-2 & \end{array} \Rightarrow \mathbf{m = ?}$$

A) 2 B) 4 C) 7

D) 8 E) 10

4.

$$\begin{array}{r|l} P(x) & x^2-3x-10 \\ \cline{2-2} - & \\ \hline 4x-2 & \end{array} \qquad \begin{array}{r|l} P(x) & x+2 \\ \cline{2-2} - & \\ \hline K(x) & \end{array} \Rightarrow \mathbf{K(x) = ?}$$

A) –10 B) –7 C) –5

D) –3 E) –2

---

5. $P(x) + 2P(-x) = 3x^2 - 4x + 5 \Rightarrow \mathbf{P(1) = ?}$

A) $\frac{17}{3}$ B) $\frac{19}{3}$ C) $\frac{20}{3}$

D) $\frac{23}{3}$ E) $\frac{25}{3}$

6.

$$\begin{array}{r|l} P(x) & x+3 \\ \cline{2-2} - & \\ \hline 2 & \end{array} \qquad \begin{array}{r|l} Q(x) & x+3 \\ \cline{2-2} - & \\ \hline -1 & \end{array}$$

$$\begin{array}{r|l} 2\cdot P(x)\cdot x + Q(x)\cdot x^2 - 3x + a & x+3 \\ \cline{2-2} - & \\ \hline 0 & \end{array} \Rightarrow \mathbf{a = ?}$$

A) 4 B) 8 C) 9

D) 12 E) 16

7. $\dfrac{P(x-2)}{Q(x+3)} = x^2 + x - 3,\ Q(0) = 2 \Rightarrow \mathbf{P(-5) = ?}$

A) 0 B) 2 C) 4 D) 6 E) 8

8.
$$\begin{array}{r|l} x^4 - 4x^3 + x^2 + ax + 1 & x^3 - 1 \\ \cline{2-2} - & \\ \cline{1-1} x^2 - x - 3 & \end{array} \quad \Rightarrow \mathbf{a = ?}$$

A) –9 B) –7 C) –5 D) –4 E) –2

9.
$$\begin{array}{r|l} 2x^{20} - 3x^{15} + x^{10} - x^5 + 3 & x^5 - 2 \\ \cline{2-2} - & \\ \cline{1-1} K(x) & \end{array} \quad \Rightarrow \mathbf{K(x) = ?}$$

A) 12 B) 13 C) 14 D) 15 E) 16

10. $P(x) = -3 \cdot x^{40} + 12 \cdot x^{20} - 12 \Rightarrow \mathbf{P\left(\sqrt[5]{2}\right) = ?}$

A) –768 B) – 640 C) –612 D) – 588 E) – 542

11. $(x^2 + x + 1) \cdot P(x + 5) = x^3 - 1 \Rightarrow \mathbf{P(x) = ?}$

A) x + 6 B) x – 5 C) x – 6 D) x + 5 E) x – 1

12. $P(x) = x^3 - 3mx^2 + 9x + n,$
$$\begin{array}{r|l} P(x) & (x-1)^2 \\ \cline{2-2} - & \\ \cline{1-1} 0 & \end{array} \quad \Rightarrow \mathbf{n = ?}$$

A) –4 B) –2 C) 0 D) 2 E) 4

YANITLAR / ANSWERS							
1. D	2. E	3. B	4. A	5. C	6. D	7. D	8. E
9. B	10. D	11. C	12. A				

1. $(x+3)\cdot P(x) = 2x^2 - x + a$

$x = -3 \Rightarrow (-3+3)\cdot P(-3) = 2\cdot(-3)^2 - (-3) + a$

$0 = 18 + 3 + a$

$a = -21$

$x = -2 \Rightarrow (-2+3)\cdot P(-2) = 2\cdot(-2)^2 - (-2) - 21$

$P(-2) = 8 + 2 - 21$

$= -11$

Yanıt / The Answer is D

2.

$$\begin{array}{r|l} P(x) & x+1 \\ \hline K(x) & \end{array} \Rightarrow K(x) = P(-1)$$

$P(x-2) = 3x^2 - 2x + 3$

$x - 2 = -1 \Rightarrow x = 1$

$P(-1) = 3\cdot 1^2 - 2\cdot 1 + 3$

$= 4$

Yanıt / The Answer is E

---

3. $x^2 + x = 0 \Rightarrow x^2 = -x$

$P(x) = 2x^3 + mx - 2$

$= 2x^2 \cdot x + mx - 2$

$x^2 = -x \Rightarrow P(x) = 2\cdot(-x)\cdot x + mx - 2$

$= -2x^2 + mx - 2$

$= 2x + mx - 2$

$(m+2)x - 2 = 6x - 2$

$m = 4$

Yanıt / The Answer is B

---

4. $x^2 - 3x - 10 = (x-5)\cdot(x+2)$

$P(x) = (x^2 - 3x - 10)\cdot Q(x) + 4x - 2$

$x + 2 = 0 \Rightarrow x = -2$

$P(-2) = 0 + 4\cdot(-2) - 2$

$= -10$

Yanıt / The Answer is A

---

5. $P(x) = ax^2 + bx + c$

$P(-x) = ax^2 - bx + c$

$\Rightarrow P(x) + 2\cdot P(-x) = 3ax^2 - bx + 3c$

$3x^2 - 4x + 5 = 3ax^2 - bx + 3c$

$a = 1 \ , \quad b = 4 \ , \quad c = \frac{5}{3}$

$P(x) = x^2 + 4x + \frac{5}{3}$

$P(1) = 1 + 4 + \frac{5}{3} = \frac{20}{3}$

Yanıt / The Answer is C

---

6. $P(-3) = 2 \ , \quad Q(-3) = -1$

$2\cdot P(x)\cdot x + Q(x)\cdot x^2 - 3x + a = 2\cdot P(-3)\cdot(-3) + Q(-3)\cdot(-3)^2 - 3\cdot(-3) + a$

$0 = 2\cdot(2)\cdot(-3) + (-1)\cdot 9 + 9 + a$

$0 = -12 + a \Rightarrow a = 12$

Yanıt / The Answer is D

7. $\dfrac{P(x-2)}{Q(x+3)} = x^2 + x - 3$

$P(x-2) = (x^2 + x - 3) \cdot Q(x+3)$

$x + 3 = 0 \Rightarrow x = -3$

$P(-3-2) = ((-3)^2 - 3 - 3) \cdot Q(0)$

$P(-5) = 3 \cdot 2 = 6$

Yanıt / The Answer is D

8. $x^3 - 1 = 0 \;\Rightarrow\; x^3 = 1$

$x^4 - 4x^3 + x^2 + ax + 1 = (x^3 - 1) \cdot Q(x) + x^2 - x - 3$

$x^3 \cdot x - 4x^3 + x^2 + ax + 1 = (x^3 - 1) \cdot Q(x) + x^2 - x - 3$

$x^3 = 1 \;\Rightarrow\; x - 4 + x^2 + ax + 1 = x^2 - x - 3$

$x^2 + (a+1)x - 3 = x^2 - x - 3$

$\Rightarrow\; a = -2$

Yanıt / The Answer is E

9. $2x^{20} - 3x^{15} + x^{10} - x^5 + 3 = (x^5 - 2) \cdot Q(x) + K(x)$

$x^5 - 2 = 0 \;\Rightarrow\; x^5 = 2$

$2 \cdot (x^5)^4 - 3 \cdot (x^5)^3 + (x^5)^2 - x^5 + 3 = (x^5 - 2) \cdot Q(x) + K(x)$

$2 \cdot 2^4 - 3 \cdot 2^3 + 2^2 - 2 + 3 = K(x)$

$32 - 24 + 4 + 1 = K(x)$

$K(x) = 13$

Yanıt / The Answer is B

10. $P(x) = -3 \cdot (x^5)^8 + 12 \cdot (x^5)^4 - 12$

$x = \sqrt[5]{2} \;\Rightarrow\; P\left(\sqrt[5]{2}\right) = -3 \cdot \left(\left(\sqrt[5]{2}\right)^5\right)^8 + 12\left(\left(\sqrt[5]{2}\right)^5\right)^4 - 12$

$= -3 \cdot 2^8 + 12 \cdot 2^4 - 12 = -588$

Yanıt / The Answer is D

11. $(x^2 + x + 1) \cdot P(x+5) = x^3 - 1$

$P(x+5) = \dfrac{x^3 - 1}{x^2 + x + 1}$

$= \dfrac{(x-1) \cdot (x^2 + x + 1)}{x^2 + x + 1}$

$= x - 1$

$P(x - 5 + 5) = x - 5 - 1$

$P(x) = x - 6$

Yanıt / The Answer is C

12. $P(x) = x^3 - 3mx^2 + 9x + n$

$P'(x) = 3x^2 - 6mx + 9$

$x = 1 \;\Rightarrow\; P(1) = 1 - 3m + 9 + n = 0 \;\Rightarrow\; 3m - n = 10$

$P'(1) = 3 - 6m + 9 = 0 \Rightarrow\; m = 2$

$3m - n = 10$

$3 \cdot 2 - n = 10$

$6 - n = 10$

$n = -4$

Yanıt / The Answer is A

1. $P(x-1) + P(x+1) = 4x + 6 \Rightarrow \mathbf{P(x) = ?}$

Yanıt / The Answer is: **2x + 3**

2. $(x-2) \cdot P(x) = 3x^2 + ax + 4 \Rightarrow \mathbf{P(1) = ?}$

Yanıt / The Answer is: **1**

3. $P(x) = ax^3 - 2x^2 + 2x - 1,$

$$\begin{array}{r|l} P(x) & x+2 \\ \hline - & \\ -29 & \end{array} \quad \Rightarrow \mathbf{a = ?}$$

Yanıt / The Answer is: **2**

4. $P(x) = (2x-1) \cdot Q(x+3) + 3x - 2,$

$Q(1) = 3 \Rightarrow \mathbf{P(-2) = ?}$

Yanıt / The Answer is: **−23**

5. $x \cdot P(x) = x^3 - 2x^2 + x - a \Rightarrow \mathbf{P(-1) = ?}$

Yanıt / The Answer is: **4**

6. $P(x) = x^2 - ax + 3,$

$$\begin{array}{r|l} P(x+1) & x-2 \\ \hline - & \\ 6 & \end{array} \quad \Rightarrow \mathbf{a = ?}$$

Yanıt / The Answer is: **2**

7. $P(x) = x^3 - x^2 + mx - 2,$

$$\begin{array}{r|l} P(x) & x^2 - x + 1 \\ \cline{2-2} - & \\ \hline 6x - 2 & \end{array} \quad \Rightarrow \mathbf{m = ?}$$

Yanıt / The Answer is: **7**

8.

$$\begin{array}{r|l} x^3 - 3x^2 + mx - n & x^2 - 2x - 8 \\ \cline{2-2} - & \\ \hline 0 & \end{array} \quad \Rightarrow \mathbf{m + n = ?}$$

Yanıt / The Answer is: **–14**

9. $\text{der}\,[P(x) \cdot Q(x^2)] = 11,$

$$\text{der}\left[\frac{P^2(x)}{Q(x)}\right] = 2 \Rightarrow \mathbf{der\,[P(x) + Q(x)] = ?}$$

Yanıt / The Answer is: **4**

10.

$$\begin{array}{r|l} 3x^3 - x^2 + ax - 5 & x^2 - x \\ \cline{2-2} - & \\ \hline 4x - 5 & \end{array} \quad \Rightarrow \mathbf{a = ?}$$

Yanıt / The Answer is: **2**

11.

$$\begin{array}{r|l} x^3 - 2x^2 + 3x - 1 & x^2 + 3 \\ \cline{2-2} - & Q(x) \\ \hline 5 & \end{array} \quad \Rightarrow \mathbf{Q(3) = ?}$$

Yanıt / The Answer is: **1**

12. $P(x) = x^3 + 3x^2 + 3x + 4 \Rightarrow \mathbf{P\left(\sqrt[3]{2} - 1\right) = ?}$

Yanıt / The Answer is: **5**

1. P(x) bir polinomdur. / P(x) is a polynomial.

$P(x) = x^{\frac{12}{n}} + 2x^{n-3} - 3x + 5 \Rightarrow \mathbf{\sum n = ?}$

A) 10
B) 13
C) 18
D) 25
E) 28

2. $P(x) = 4x^3 - 2x^2 + 3x - 4 \Rightarrow \mathbf{P(-1) = ?}$

A) –13
B) –9
C) –3
D) 4
E) 7

3. $P(x + 3) = 2x^3 + ax + 5,\ P(4) = 10 \Rightarrow \mathbf{a = ?}$

A) 1
B) 2
C) 3
D) 4
E) 5

4. $P(2x - 1) = 2x^2 + (m + 1)x - 6,$

$P(3) = 12 \Rightarrow \mathbf{m = ?}$

A) 2
B) 4
C) 5
D) 6
E) 8

5. $P(-5x) = -125x^3 + 25x^2 - 10x + 4 \Rightarrow \mathbf{P(3) = ?}$

A) 40
B) 42
C) 44
D) 45
E) 46

6. $P(x + 2) = 3x^2 - 2x + 5 \Rightarrow \mathbf{P(x) = ?}$

A) $3x^2 - 10x + 20$
B) $3x^2 - 14x + 21$
C) $3x^2 - 16x + 8$
D) $3x^2 - 8x + 10$
E) $3x^2 - 18x + 15$

7. $P(x-1) = x^2 + 3x - 5 \Rightarrow$ **$P(x) = ?$**

A) $x^2 + 5x - 1$

B) $x^2 + 3x + 8$

C) $x^2 - 4x + 6$

D) $x^2 + 3x + 3$

E) $x^2 - 2x + 8$

8. $P(x+4) = 3x^2 - x + 2 \Rightarrow$ **$P(x+1) = ?$**

A) $3x^2 - 19x + 32$

B) $3x^2 + 8x - 4$

C) $3x^2 - 15x + 25$

D) $3x^2 - 7x - 12$

E) $3x^2 + 12x - 8$

9. $(x^3 - 4x^2 + 8x + 5)\cdot(x^2 - 2x + 4) = \ldots + ax^2 \ldots$

$\Rightarrow$ **$a = ?$**

A) –20

B) –22

C) –25

D) –27

E) –30

10. $P(x) = 4x^2 - (a-4)x + 7$

$Q(x) = (b+2)x^3 - (c-b)x^2 + 3x - d + 1$

$P(x) = Q(x) \Rightarrow$ **$a + b + c + d = ?$**

A) –3

B) –5

C) –7

D) –9

E) –13

11. $\text{der}[P(x)] = 3$,

$\text{der}[Q(x)] = 2 \Rightarrow$ **$d[P(Q(x))] = ?$**

A) 2

B) 3

C) 4

D) 6

E) 9

12. $\text{der}[P^2(x)\cdot Q(x)] = 8$,

$$\text{der}\left[\frac{P(x)}{Q(x)}\right] = 1 \Rightarrow \textbf{der}\left[Q(x)\cdot x^2\right] = ?$$

A) 4

B) 5

C) 6

D) 7

E) 8

YANITLAR / ANSWERS							
1. D	**2. A**	**3. C**	**4. B**	**5. E**	**6. B**	**7. A**	**8. A**
9. D	**10. E**	**11. D**	**12. A**				

1. $x^3 + ax + b = (x^2 - 1)\cdot Q(x) + 3x - 1 \Rightarrow$ **$a - 2b = ?$**

A) 1 B) 2 C) 3 D) 4 E) 5

2. $P(x) = 3x^2 - 6x + 7,$

$$\begin{array}{r|l} P(x) & x-1 \\ \cline{2-2} - \quad & \\ \hline K(x) & \end{array} \Rightarrow \mathbf{K(x) = ?}$$

A) 2 B) 4 C) 5 D) 6 E) 8

3. $P(x) = x^3 + ax^2 - 3x + 1,$

$$\begin{array}{r|l} P(x) & 2x-4 \\ \cline{2-2} - \quad & \\ \hline 15 & \end{array} \Rightarrow \mathbf{a = ?}$$

A) 1 B) 2 C) 3 D) 5 E) 7

4. $P(x + 3) = 2x^2 - 3x + 1$

$$\begin{array}{r|l} P(x) & x+1 \\ \cline{2-2} - \quad & \\ \hline K(x) & \end{array} \Rightarrow \mathbf{K(x) = ?}$$

A) 26 B) 30 C) 35 D) 42 E) 45

5. $P(x + 1) = -x^2 - 3x + 1,$

$$\begin{array}{r|l} P(x-2) & x+3 \\ \cline{2-2} - \quad & \\ \hline K(x) & \end{array} \Rightarrow \mathbf{K(x) = ?}$$

A) –17 B) –20 C) –23 D) –28 E) –32

6. $P(x - 2) = 2x^2 + 3x - 1,$

$$\begin{array}{r|l} P(x+1) & x \\ \cline{2-2} - \quad & \\ \hline K(x) & \end{array} \Rightarrow \mathbf{K(x) = ?}$$

A) 18 B) 20 C) 24 D) 26 E) 28

7. $P(x) = x^6 + 8x^3 - 6x^2 + (n+2)x - 12$

$$\begin{array}{r|l} P(x) & x-1 \\ \cline{2-2} \underline{-} & \\ -2 & \end{array} \quad \Rightarrow \quad \begin{array}{r|l} \mathbf{P(x)} & \mathbf{x+1} \\ \cline{2-2} \underline{-} & \\ \mathbf{?} & \end{array}$$

A) 32
B) 24
C) –12
D) –24
E) –32

8.

$$\left.\begin{array}{l} P(x) = ax^4 + 3bx^2 - 9x + 12 \\ \begin{array}{r|l} P(x) & x^2-2x+1 \\ \cline{2-2} \underline{-} & \\ 0 & \end{array} \end{array}\right\} \Rightarrow \mathbf{a + b = ?}$$

A) 4
B) 8
C) 9
D) 12
E) 15

9. $P(x) = 12x^{20} - 3x^{12} + x^6 - x + 4,$

$$\begin{array}{r|l} P(x) & x^5-1 \\ \cline{2-2} \underline{-} & \\ K(x) & \end{array} \quad \Rightarrow \mathbf{K(x) = ?}$$

A) $-2x^2 + 5$
B) $-3x^2 + 16$
C) $x^2 - x + 3$
D) $4x^2 - 7$
E) $5x^2 + 1$

10. $P(x) = 2x^3 - 3x^2 + x - 1,$

$$\begin{array}{r|l} P(x) & x^2-x-1 \\ \cline{2-2} \underline{-} & \\ K(x) & \end{array} \quad \Rightarrow \mathbf{K(x) = ?}$$

A) $3x + 1$
B) $2x + 3$
C) $2x - 2$
D) $2x + 7$
E) $4x - 1$

11. $P(x) = x^4 - 3x^3 + x^2 + x - 2$

$$\begin{array}{r|l} P(x) & x^2+x+2 \\ \cline{2-2} \underline{-} & \\ K(x) & \end{array} \quad \Rightarrow \mathbf{K(x) = ?}$$

A) $4x - 2$
B) $5x + 7$
C) $4x - 3$
D) $6x - 3$
E) $6x - 8$

12.

$$\begin{array}{r|l} P(x) & x-2 \\ \cline{2-2} \underline{-} & \\ 5 & \end{array} \qquad \begin{array}{r|l} P(x) & x+1 \\ \cline{2-2} \underline{-} & \\ -4 & \end{array}$$

$$\begin{array}{r|l} P(x) & x^2-x-2 \\ \cline{2-2} \underline{-} & \\ K(x) & \end{array} \quad \Rightarrow \mathbf{K(x) = ?}$$

A) $2x + 3$
B) $3x + 7$
C) $x - 4$
D) $2x + 1$
E) $3x - 1$

YANITLAR / ANSWERS							
1. D	**2. B**	**3. C**	**4. E**	**5. A**	**6. D**	**7. E**	**8. A**
9. B	**10. C**	**11. E**	**12. E**				

1. $x^2 - 5x + 8 = 0 \Rightarrow \mathbf{x_1^2 + x_2^2 = ?}$

A) 2
B) 5
C) 9
D) 10
E) 12

2. $2x^2 + mx - 2m + 1 = 0,$
$x_1 + x_2 = 3 \Rightarrow \mathbf{x_1 \cdot x_2 = ?}$

A) $\frac{13}{2}$
B) $\frac{15}{2}$
C) $\frac{17}{2}$
D) $\frac{19}{2}$
E) $\frac{21}{2}$

3. $m \in R^+,$
$x^2 - mx + 4 = 0, \quad \frac{1}{x_1} + \frac{1}{x_2} = \frac{1}{m} \Rightarrow \mathbf{m = ?}$

A) 1
B) 2
C) 4
D) 6
E) 8

4. $x^2 - (m + 5)x + 5m = 0,$
$x_1 = x_2 \Rightarrow \mathbf{m = ?}$

A) 2
B) 5
C) 7
D) 9
E) 10

5. $5^{2x} - 6 \cdot 5^{x+1} + 125 = 0 \Rightarrow \mathbf{\sum x = ?}$

A) –3
B) –1
C) 1
D) 3
E) 5

6. $x^2 + (2m + 1)x + 6 = 0,$ ÇK(SS) $= \{x_1, x_2\}$
$x^2 + (5m - 1)x + 20 = 0,$ ÇK(SS) $= \{x_1 + 2, x_2 + 2\}$
$\Rightarrow \mathbf{m = ?}$

A) $-\frac{1}{3}$
B) $-\frac{2}{3}$
C) –1
D) $-\frac{4}{3}$
E) $-\frac{5}{3}$

7. $x^2 + (2m - 4)x + m - 9 = 0,\ x_1 = -5 \quad \Rightarrow \quad \mathbf{x_2 = ?}$

A) – 2

B) – 1

C) 0

D) 1

E) 2

8. $\dfrac{x-10}{x^2+x} - \dfrac{x}{x+1} + \dfrac{4}{x} = 0 \quad \Rightarrow \quad$ **ÇK (SS) = ?**

A) {–1, 2}

B) {1 , 2}

C) {1, 3}

D) {2 , 3}

E) {– 4, – 3}

9. $\dfrac{x^2-7x+10}{x-5} = 0 \quad \Rightarrow \quad$ **ÇK (SS) = ?**

A) {2 ,5 }

B) { 5 }

C) { 2 }

D) Ø

E) R

10. $x^2 - x + x^5 - x^4 = 0 \ \Rightarrow$ **ÇK(SS) = ?**

A) {–1, 0, 1}

B) {–1, 0}

C) { 0, 1}

D) {0}

E) {1}

11. $3^x + \dfrac{1}{3^x} - \dfrac{10}{3} = 0 \quad \Rightarrow \quad \mathbf{x_1 + x_2 = ?}$

A) – 2

B) – 1

C) 0

D) 1

E) 2

12. $x + 2 + \dfrac{m+2}{x-2} = 1,\ x_1 \cdot x_2 = 2 \Rightarrow \mathbf{m = ?}$

A) 2

B) 3

C) 4

D) 5

E) 6

YANITLAR / ANSWERS							
1. C	2. A	3. B	4. B	5. D	6. B	7. D	8. D
9. C	10. A	11. C	12. A				

1. $x_1^2+x_2^2=(x_1+x_2)^2-2x_1\cdot x_2$

$$=\left(-\frac{b}{a}\right)^2-2\cdot\frac{c}{a}$$

$$=5^2-2\cdot 8$$

$$=9$$

Yanıt / The Answer is C

---

2. $x_1+x_2=3 \Rightarrow \dfrac{-m}{2}=3$

$$m=-6$$

$$x_1\cdot x_2=\frac{-2m+1}{2}=\frac{-2\cdot(-6)+1}{2}=\frac{13}{2}$$

Yanıt / The Answer is A

---

3. $\dfrac{1}{x_1}+\dfrac{1}{x_2}=\dfrac{x_1+x_2}{x_1\cdot x_2}=\dfrac{1}{m}$

$$\frac{-\frac{b}{a}}{\frac{c}{a}}=\frac{1}{m}$$

$$\frac{m}{4}=\frac{1}{m}$$

$$m^2=4$$

$m\in R^+ \Rightarrow m=2$

Yanıt / The Answer is B

---

4. $\left.\begin{array}{l} x^2-(m+5)x+5m=0 \\ x_1=x_2 \end{array}\right\} \Rightarrow \Delta=0$

$$\Delta=b^2-4ac$$

$$\Delta=(m+5)^2-4\cdot 1\cdot 5m=0$$

$$\Delta=m^2+10m+25-20m=0$$

$$\Delta=m^2-10m+25=0$$

$$(m-5)^2=0 \Rightarrow m=5$$

Yanıt / The Answer is B

---

5. $5^{2x}-6\cdot 5^{x+1}+125=0$

$5^x=t \Rightarrow t^2-30t+125=0$

$(t-5)\cdot(t-25)=0$

$t_1=5\ ,\ t_2=25$

$5^x=5 \Rightarrow x_1=1$

$5^x=25 \Rightarrow x_2=2$

$\sum x=1+2=3$

Yanıt / The Answer is D

---

6. $x^2+(2m+1)x+6=0 \Rightarrow x_1+x_2=\dfrac{-2m-1}{1}$

$x^2+(5m-1)x+20=0 \Rightarrow x_1+2+x_2+2=\dfrac{-5m+1}{1}$

$$\frac{-2m-1}{1}+4=\frac{-5m+1}{1}$$

$$4=1-5m+2m+1$$

$$2=-3m$$

$$m=-\frac{2}{3}$$

Yanıt / The Answer is B

7. $x^2 + (2m-4)\cdot x + m - 9 = 0$

$x_1 = -5 \Rightarrow (-5)^2 + (2m-4)\cdot(-5) + m - 9 = 0$

$25 - 10m + 20 + m - 9 = 0$

$-9m + 36 = 0$

$-9m = -36$

$m = 4$

$x^2 + 4x - 5 = 0$

$(x+5)(x-1) = 0$

$x = -5$ veya (or) $x = 1$

Yanıt / The Answer is D

---

8. $$\frac{x-10}{x^2+x} - \underset{(x)}{\frac{x}{x+1}} + \underset{(x+1)}{\frac{4}{x}} = 0$$

$$\frac{x-10-x^2+4x+4}{x^2+x} = 0$$

$x - 10 - x^2 + 4x + 4 = 0$

$-x^2 + 5x - 6 = 0$

$x^2 - 5x + 6 = 0$

$(x-2)\cdot(x-3) = 0$

$x_1 = 2\ ,\ x_1 = 3$

ÇK(SS) = {2 , 3}

Yanıt / The Answer is D

---

9. $$\frac{x^2-7x+10}{x-5} = 0$$

$x^2 - 7x + 10 = 0$

$(x-5)(x-2) = 0$

$x - 5 = 0$ veya (or) $x - 2 = 0$

$x = 5$ $\qquad x = 2$

$\Rightarrow$ ÇK(SS) = {2}

Yanıt / The Answer is C

---

10. $x^2 - x + x^5 - x^4 = 0$

$x(x-1) + x^4(x-1) = 0$

$(x-1)\cdot x(1+x^3) = 0$

$x - 1 = 0 \qquad x = 0 \qquad 1 + x^3 = 0$

$x = 1 \qquad\qquad x^3 = -1$

$x = -1$

ÇK(SS) = {–1, 0, 1}

Yanıt / The Answer is A

---

11. $$3^x + \frac{1}{3^x} - \frac{10}{3} = 0$$

$$3^x = t \Rightarrow \underset{(3t)}{\frac{t}{1}} + \underset{(3)}{\frac{1}{t}} - \underset{(t)}{\frac{10}{3}} = 0$$

$$\frac{3t^2+3-10t}{3t} = 0$$

$3t^2 - 10t + 3 = 0$

$(3t-1)\cdot(t-3) = 0$

$3t - 1 = 0$ veya (or) $t - 3 = 0$

$t = \frac{1}{3} \qquad t = 3$

$3^x = \frac{1}{3} = 3^{-1} \qquad 3^x = 3$

$x = -1 \qquad x = 1$

$x_1 + x_2 = (-1) + 1 = 0$

Yanıt / The Answer is C

---

12. $$\underset{(x-2)}{\frac{x+2}{1}} + \frac{m+2}{x-2} = 1$$

$$\frac{x^2-4+m+2}{x-2} = 1$$

$$\frac{x^2+m-2}{x-2} = 1$$

$x^2 + m - 2 = x - 2$

$x^2 - x + m = 0$

$x_1 \cdot x_2 = \frac{c}{a}$

$m = 2$

Yanıt / The Answer is A

1. $x^2 - 6x + a = 0,$

$2x_1 - x_2 = 9 \Rightarrow \mathbf{a = ?}$

Yanıt / The Answer is: **5**

---

2. $\left(\frac{x-2}{2x-3}\right)^2 - \left(\frac{2x-3}{x-2}\right)^{-1} = 12 \Rightarrow \mathbf{\sum x = ?}$

Yanıt / The Answer is: **3**

---

3. $x^2 + 2x - 2m + 1 = 0,$

$2x_1 + x_2 = 1 \Rightarrow \mathbf{m = ?}$

Yanıt / The Answer is: **8**

---

4. $\sqrt{x+2} = x - 4 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is: **{2, 7}**

---

5. $x^2 - 3x - 1 = 0 \Rightarrow \mathbf{\frac{1}{x_1 - 2} + \frac{1}{x_2 - 2} = ?}$

Yanıt / The Answer is: $\mathbf{\frac{1}{3}}$

---

6. $x^2 - 3x - 2 = 0 \Rightarrow \mathbf{(x_1 - 3) \cdot (x_2 - 3) = ?}$

Yanıt / The Answer is: **–2**

7. $x^2 - 3mx + (m + 2) = 0,$

$\frac{1}{x_1} + \frac{1}{x_2} = \frac{3}{2} \Rightarrow$ **m = ?**

Yanıt / The Answer is: **2**

8. $\left(x+\frac{1}{x}\right)^2 - 4\left(x+\frac{1}{x}\right) + 4 = 0 \Rightarrow$ **x = ?**

Yanıt / The Answer is: **1**

9. $x^2 + 3x + 5 = 0 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is: $\varnothing$

10. $x^2 + 2x + m - 2 = 0,$

$2x_1 - x_2 = 5 \Rightarrow$ **m = ?**

Yanıt / The Answer is: **–1**

11. $x^2 - 16x + 2m + 6 = 0$

$x_1 = 3x_2 \Rightarrow$ **m = ?**

Yanıt / The Answer is: **21**

12. $(x^2 - 2x)^2 - 23(x^2 - 2x) + 120 = 0 \Rightarrow \sum x = ?$

Yanıt / The Answer is: **4**

1. $\sqrt{x-5} + 3 = x - 4 \Rightarrow$ **ÇK(SS) = ?**

A) {6, 9} B) {6} C) {9}
D) ∅ E) R

2. $x^2 - 2mx + m^2 - 2m + 5 = 0$,
ÇK(SS) = ∅,
$m \in Z \Rightarrow$ **max(m) = ?**

A) 1 B) 2 C) 3
D) 4 E) 5

3. $x^2 - mx + m + 4 = 0$,
$\frac{1}{x_1} + \frac{1}{x_2} = 3 \Rightarrow$ **m = ?**

A) 4 B) 2 C) –1
D) –4 E) –6

4. $2x^2 + (m + 1)x - 5 = 0$
$x_1(x_2 - 3) - x_2(3 - x_1) = 7 \Rightarrow$ **m = ?**

A) 10 B) 9 C) 8
D) 7 E) 6

5. $3x^2 - (3k - 6)x + 2k + 1 = 0$,
$x_1 < x_2$,
$|x_1| = x_2 \Rightarrow$ **k = ?**

A) 2 B) 3 C) 5
D) 6 E) 9

6. $2x^2 - mx + 6 = 0$,
$x_1 \cdot x_2^2 = 18 \Rightarrow$ **m = ?**

A) 5 B) 8 C) 10
D) 11 E) 13

7. $m \in R^+$,

$x^2 + mx - 5 = 0$,

$$\frac{1}{x_1^2} + \frac{1}{x_2^2} = \frac{26}{25} \Rightarrow \mathbf{m = ?}$$

A) 0 B) 2 C) 4

D) 5 E) 7

8. $mx^2 - 3mx + 9 = 0$,

$x_1 = x_2 \Rightarrow \mathbf{m = ?}$

A) –3 B) –1 C) 2

D) 4 E) 7

9. $(x^2 - x)^2 - 22(x^2 - x) + 40 = 0 \Rightarrow \sum \mathbf{x = ?}$

A) –10 B) –8 C) –5

D) –1 E) 2

10. $9^x - 4 \cdot 3^{x+1} + 27 = 0 \Rightarrow$ **ÇK(SS) = ?**

A) {–1, –2} B) {–1, 2} C) {1, 2}

D) {1, 3} E) {2, 3}

11. $(m - 2)x^2 + 3mx - 4 = 0,\ x_1 = x_2 \Rightarrow \sum \mathbf{m = ?}$

A) – 1 B) $-\frac{10}{9}$ C) $-\frac{14}{9}$

D) $-\frac{16}{9}$ E) $-\frac{20}{9}$

12. $x^2 - 7x + 5 = 0 \Rightarrow \mathbf{x_1^3 + x_2^3 = ?}$

A) 230 B) 238 C) 242

D) 248 E) 250

YANITLAR / ANSWERS

1. C	**2. B**	**3. E**	**4. D**	**5. A**	**6. E**	**7. C**	**8. D**
9. E	**10. C**	**11. D**	**12. B**				

1. $\sqrt{x-5}+3=x-4 \Rightarrow$ **ÇK(SS) = ?**

A) {6, 9} B) {6} C) {9}

D) ∅ E) R

2. $x^2-2mx+m^2-2m+5=0,$

$ÇK(SS)=\varnothing,$

$m \in Z \Rightarrow$ **max(m) = ?**

A) 1 B) 2 C) 3

D) 4 E) 5

3. $x^2-mx+m+4=0,$

$\frac{1}{x_1}+\frac{1}{x_2}=3 \Rightarrow$ **m = ?**

A) 4 B) 2 C) –1

D) –4 E) –6

4. $2x^2+(m+1)x-5=0$

$x_1(x_2-3)-x_2(3-x_1)=7 \Rightarrow$ **m = ?**

A) 10 B) 9 C) 8

D) 7 E) 6

5. $3x^2-(3k-6)x+2k+1=0,$

$x_1<x_2,$

$|x_1|=x_2 \Rightarrow$ **k = ?**

A) 2 B) 3 C) 5

D) 6 E) 9

6. $2x^2-mx+6=0,$

$x_1 \cdot x_2^2=18 \Rightarrow$ **m = ?**

A) 5 B) 8 C) 10

D) 11 E) 13

7. $m \in R^+$,

$x^2 + mx - 5 = 0$,

$\frac{1}{x_1^2} + \frac{1}{x_2^2} = \frac{26}{25} \Rightarrow$ **$m = ?$**

A) 0 B) 2 C) 4 D) 5 E) 7

8. $mx^2 - 3mx + 9 = 0$,

$x_1 = x_2 \Rightarrow$ **$m = ?$**

A) –3 B) –1 C) 2 D) 4 E) 7

9. $(x^2 - x)^2 - 22(x^2 - x) + 40 = 0 \Rightarrow$ **$\sum x = ?$**

A) –10 B) –8 C) –5 D) –1 E) 2

10. $9^x - 4 \cdot 3^{x+1} + 27 = 0 \Rightarrow$ **ÇK(SS) = ?**

A) {–1, –2} B) {–1, 2} C) {1, 2} D) {1, 3} E) {2, 3}

11. $(m - 2)x^2 + 3mx - 4 = 0,\ x_1 = x_2 \Rightarrow$ **$\sum m = ?$**

A) –1 B) $-\frac{10}{9}$ C) $-\frac{14}{9}$ D) $-\frac{16}{9}$ E) $-\frac{20}{9}$

12. $x^2 - 7x + 5 = 0 \Rightarrow$ **$x_1^3 + x_2^3 = ?$**

A) 230 B) 238 C) 242 D) 248 E) 250

YANITLAR / ANSWERS

1. C 2. B 3. E 4. D 5. A 6. E 7. C 8. D

9. E 10. C 11. D 12. B

1. $2x^2 + x - 1 = 0 \Rightarrow$ **ÇK(SS) = ?**

A) $\left\{\frac{1}{2}, 1\right\}$ B) $\left\{-1, \frac{1}{2}\right\}$ C) $\{-2, -1\}$

D) $\{-1, 1\}$ E) $\{-1, 0\}$

2. $\frac{x-1}{x-2} - \frac{8}{3} = \frac{x-2}{x-1} \Rightarrow$ **ÇK(SS) = ?**

A) $\left\{\frac{5}{4}, \frac{5}{2}\right\}$ B) $\left\{\frac{1}{2}, \frac{2}{3}\right\}$ C) $\left\{-\frac{2}{3}, \frac{5}{2}\right\}$

D) $\left\{-\frac{1}{3}, 2\right\}$ E) $\{-1, 2\}$

3. $x^{-2} - 3 \cdot x^{-1} + 2 = 0 \Rightarrow$ **ÇK(SS) = ?**

A) $\left\{\frac{1}{3}, 1\right\}$ B) $\left\{-1, \frac{1}{2}\right\}$ C) $\left\{-2, \frac{1}{3}\right\}$

D) $\left\{\frac{1}{3}, \frac{1}{2}\right\}$ E) $\left\{\frac{1}{2}, 1\right\}$

4. $\sqrt{x+6} - x = 4 \Rightarrow$ **ÇK(SS) = ?**

A) $\{-5\}$ B) $\{-2\}$ C) $\{-5, -2\}$

D) $\{-2, -3\}$ E) $\{-1, 0\}$

5. $\sqrt{x + \sqrt{x-2}} = 2 \Rightarrow$ **ÇK(SS) = ?**

A) $\varnothing$ B) $\{2\}$ C) $\{3\}$

D) $\{3, 6\}$ E) $\{2, 3\}$

6. $4^{x^2+x-6} = 1 \Rightarrow$ **ÇK(SS) = ?**

A) $\{-2, 3\}$ B) $\{-1, 4\}$ C) $\{-2, 4\}$

D) $\{-3, 2\}$ E) $\{-3, 4\}$

7. $3^{x^2-x} = 729 \Rightarrow$ **ÇK(SS) = ?**

A) {–2, 3}
B) {2, 3}
C) {–1, 4}
D) {–3, 1}
E) {2, 5}

8. $2 \cdot 3^{2x} - 3 \cdot 3^{x} - 9 = 0 \Rightarrow$ **ÇK(SS) = ?**

A) ∅
B) {1}
C) {3}
D) {4}
E) {5}

9. $x^3 - 3x^2 - 4x = 0 \Rightarrow$ **ÇK(SS) = ?**

A) {–1, 0, 3}
B) {–1, 0, 4}
C) {2, 4, 5}
D) {–2, 1, 2}
E) {–3, 0, 2}

10. $x^2 + \frac{1}{x-5} = 4x - \frac{1}{5-x} \Rightarrow$ **$\sum x = ?$**

A) 2
B) 3
C) 4
D) 5
E) 6

11. $\sqrt{2x+5} - 1 = x \Rightarrow$ **x = ?**

A) 2
B) 4
C) 6
D) 8
E) 10

12. $6x^2 - xy - y^2 = 50,$

$3x + y = 10 \Rightarrow$ **x = ?**

A) –1
B) 0
C) 1
D) 2
E) 3

YANITLAR / ANSWERS

1. B	**2. A**	**3. E**	**4. B**	**5. C**	**6. D**	**7. A**	**8. B**
9. B	**10. C**	**11. A**	**12. E**				

1. $m \in R^+$,

$mx^2 - 4mx + 8 = 0$,

$x_1 = x_2 \Rightarrow$ **m = ?**

A) 2
B) 3
C) 4
D) 5
E) 6

2. $x^2 + bx + c = 0$,

$x_1 = 3 + \sqrt{2} \Rightarrow$ **b + c = ?**

A) –1
B) 0
C) 1
D) 2
E) 3

3. $x^2 - (m + 1)x + 3 = 0$,

$x_1 = m \Rightarrow$ **x_2 = ?**

A) –3
B) –1
C) 1
D) 4
E) 6

4. $2x^2 - (m - 4)x - 3m = 0$,

$x_1 \cdot x_2^2 = -\frac{9}{2}m \Rightarrow$ **m = ?**

A) 1
B) 3
C) 4
D) 5
E) 8

5. $x^2 - 3x - 6 = 0 \Rightarrow \left(\frac{1}{x_1} + x_2\right) \cdot \left(\frac{1}{x_2} + x_1\right) = ?$

A) $-\frac{25}{6}$
B) $-\frac{19}{6}$
C) $-\frac{13}{6}$
D) $-\frac{7}{6}$
E) $-\frac{1}{6}$

6. $x^2 - (m - 3)x - 12 = 0$,

$x_1 = m \Rightarrow$ **m = ?**

A) –4
B) –2
C) 0
D) 2
E) 4

7. $x^2 - 5x + 2 = 0 \Rightarrow \frac{5}{x_1} + \frac{x_1 + x_2}{x_2} = ?$

A) $\frac{23}{2}$

B) $\frac{25}{2}$

C) $\frac{27}{2}$

D) $\frac{29}{2}$

E) $\frac{31}{2}$

8. $x^2 + (3 - m)x + 2m + 1 = 0$,

$x_1 + x_2 = 5 \Rightarrow \mathbf{x_1 \cdot x_2^2 + x_1^2 \cdot x_2 = ?}$

A) 65

B) 70

C) 75

D) 80

E) 85

9. $4x^2 - 8x - 5m - 2 = 0$,

$2x_1 - x_2 = 7 \Rightarrow$ **m = ?**

A) 1

B) 2

C) 3

D) 4

E) 5

10. $x^2 + x_1 \cdot x - 4x_1 = 0$,

ÇK(SS) = $\{x_1, x_2\} \Rightarrow \mathbf{x_1 + x_2 = ?}$

A) 1

B) 2

C) –1

D) –2

E) –3

11. $x^2 - (m - 3)x + 2n - 1 = 0$, ÇK(SS) = {a, b}

$x^2 - (2m + 1)x + n - 5 = 0$, ÇK(SS) = {a, b}

$\Rightarrow$ **m + n = ?**

A) –4

B) –6

C) –8

D) –10

E) –12

12. $y = ax^2 + bx + c$,

ÇK(SS) = $\{2 - \sqrt{5}, 2 + \sqrt{5}\} \Rightarrow$ **y = ?**

A) $x^2 - 4x - 1$

B) $x^2 + 4x - 1$

C) $x^2 - x + 4$

D) $x^2 + 5x - 4$

E) $x^2 + x - 2$

YANITLAR / ANSWERS

1. A	**2. C**	**3. C**	**4. D**	**5. A**	**6. E**	**7. B**	**8. E**
9. B	**10. D**	**11. C**	**12. A**				

1. $3 - 6x \le 0 \quad \Rightarrow \quad$ **ÇK (SS) = ?**

A) $\left[-\frac{1}{2}, \infty\right)$

B) $\left(\frac{1}{2}, \infty\right)$

C) $\left[\frac{1}{2}, \infty\right)$

D) $\left(-\frac{1}{2}, \infty\right)$

E) $\left(-\frac{1}{2}, \frac{1}{2}\right)$

2. $\frac{x+1}{x^2+4} \ge 0 \Rightarrow ? \le x \le ?$

A) $-1 \le x < \infty$

B) $-2 \le x < \infty$

C) $-3 \le x < \infty$

D) $-4 \le x < \infty$

E) $-5 \le x < \infty$

3. $x^2 - 6x + 5 > 0 \Rightarrow ? < x < ?$

A) $(-\infty, -2) \cup (3, \infty)$

B) $(-\infty, 1) \cup (3, \infty)$

C) $(-\infty, -2) \cup (6, \infty)$

D) $(-\infty, 1) \cup (5, \infty)$

E) $(-\infty, -1) \cup (4, \infty)$

4. $\frac{-x^2 + 3x + 4}{x^2 + 5} > 0 \quad \Rightarrow \quad ? < x < ?$

A) $-5 < x < 1$

B) $-4 < x < 2$

C) $-4 < x < 1$

D) $-1 < x < 5$

E) $-1 < x < 4$

5. $\frac{x+1}{x-1} - \frac{x+3}{x-2} > 0 \Rightarrow$ **ÇK(SS) = ?**

A) $\left(-\infty, \frac{1}{3}\right) \cup (1, 2)$

B) $(-\infty, -1) \cup (1, 2)$

C) $(-\infty, 0) \cup (2, 5)$

D) $(-\infty, -3) \cup (1, 5)$

E) $\left(-\infty, \frac{2}{3}\right) \cup \left(\frac{1}{2}, 3\right)$

6. $x \in Z$,

$$\frac{|x-3|-4}{x^2-x-12} \le 0 \Rightarrow \sum x = ?$$

A) 12

B) 13

C) 14

D) 15

E) 16

7. $\dfrac{(x^2+1)(2-x)}{x^2-4x+4} < 0 \Rightarrow$ **? < x < ?**

A) $5 < x < \infty$

B) $4 < x < \infty$

C) $2 < x < \infty$

D) $1 < x < \infty$

E) $0 < x < \infty$

8. $x \in Z$,

$\dfrac{(x-1)^2}{x^2-6x+5} < 0 \Rightarrow$ **ÇK(SS) = ?**

A) {1, 2, 3, 4}

B) {2, 3, 4}

C) {2, 3, 4, 5}

D) { –1, 1, 2, 3}

E) { – 2, –1, 0}

9. $x \in Z$,

$\dfrac{(x^2+5)\cdot(x-3)}{|3x+1|} < 0 \Rightarrow$ **max(x) = ?**

A) 0

B) 2

C) 4

D) 6

E) 8

10. $\left(\dfrac{2}{5}\right)^{x^2+4} > \left(\dfrac{25}{4}\right)^{2x} \Rightarrow$ **ÇK(SS) = ?**

A) ∅

B) (–2, 2)

C) (–2, 0)

D) (0, 2)

E) R

11. $\left.\begin{array}{l} x^2-3x-4<0 \\ x^2+7x+10<0 \end{array}\right\} \Rightarrow$ **ÇK(SS) = ?**

A) ∅

B) (–∞, –5)

C) (–5, –2)

D) (–2, –1)

E) (–1, 4)

12. $(x^2-1)\cdot(x+4) > 0 \Rightarrow$ **ÇK(SS) = ?**

A) (–4 , – 2) ∪ (2, ∞)

B) (–4, –1) ∪ (1, ∞)

C) (–4, 1) ∪ (2, ∞)

D) (–2, 1) ∪ (2, ∞)

E) (–1, 4) ∪ (5 ,∞)

YANITLAR / ANSWERS							
1. C	**2. A**	**3. D**	**4. E**	**5. A**	**6. D**	**7. C**	**8. B**
9. B	**10. A**	**11. A**	**12. B**				

1. $3-6x \le 0$

$3-6x=0$

$6x=3$

$x=\frac{1}{2}$

x	−∞		$\frac{1}{2}$		+∞
3− 6x		+	●	−	

$$ÇK(SS)=\left\{x \mid x \ge \frac{1}{2},\ x \in R\right\}=\left[\frac{1}{2},\infty\right)$$

Yanıt / The Answer is C

---

2. $\frac{x+1}{x^2+4} \ge 0$

$x+1=0 \Rightarrow x=-1$

$x^2+4=0 \Rightarrow x \notin R$

x	−∞		−1		+∞
x + 1		−	●	+	
x^2+4		+		+	
$\frac{x+1}{x^2+4}$		−		+	

$-1 \le x < \infty$

Yanıt / The Answer is A

---

3. $x^2-6x+5>0$

$x^2-6x+5=0$

$(x-5)\cdot(x-1)=0$

$x-5=0$ veya (or) $x-1=0$

$x=5$ $x=1$

x	−∞		1		5		+∞
x^2-6x+5		+	○	−	○	+	

$ÇK(SS)=\{x \mid -\infty<x<1$ veya (or) $5<x<\infty,\ x \in R\}$

$=(-\infty,1) \cup (5,\infty)$

Yanıt / The Answer is D

---

4. $\frac{-x^2+3x+4}{x^2+5}>0$

$-x^2+3x+4=0$

$(-x+4)(x+1)=0$

$-x+4=0$ veya (or) $x+1=0$

$x=4$ $x=-1$

$x^2+5=0 \Rightarrow x \notin R$

x	−∞		−1		4		+∞
$-x^2+3x+4$		−	○	+	○	−	
x^2+5		+		+		+	
$\frac{-x^2+3x+4}{x^2+5}$		−		+		−	

$-1<x<4$

Yanıt / The Answer is E

---

5. $\frac{x+1}{x-1}-\frac{x+3}{x-2}>0$

$\frac{x^2-2x+x-2-x^2+x-3x+3}{(x-1)\cdot(x-2)}>0$

$\frac{-3x+1}{(x-1)\cdot(x-2)}>0$

$-3x+1=0 \Rightarrow x=\frac{1}{3}$

$x-1=0 \Rightarrow x=1,\ x-2=0 \Rightarrow x=2$

x	−∞		$\frac{1}{3}$		1		2		+∞
−3x +1		+	○	−		−		−	
x −1		−		−	○	+		+	
x −2		−		−		−	○	+	
$\frac{-3x+1}{(x-1)(x-2)}$		+		−		+		−	

$$ÇK(SS)=\left\{x \mid -\infty<x<\frac{1}{3} \vee 1<x<2,\ x \in R\right\}=\left(-\infty,\frac{1}{3}\right) \cup (1,2)$$

Yanıt / The Answer is A

---

6. $\frac{|x-3|-4}{x^2-x-12} \le 0$

$|x-3|-4=0$ $x^2-x-12=0$

$|x-3|=4$ $(x-4)\cdot(x+3)=0$

$x-3=4$ $x-3=-4$ $x=4$, $x=-3$

$x=7$ $x=-1$

x		−3		−1		4		7	
$\frac{\lvert x-3\rvert-9}{x^2-x-12}$	+	○	−	●	+	○	−	●	+

$\sum x=-2+(-1)+5+6+7=15$

Yanıt / The Answer is D

7. $x^2 + 1 = 0 \Rightarrow x \notin R$

$2 - x = 0 \Rightarrow x = 2$

$x^2 - 4x + 4 = 0 \Rightarrow (x-2)^2 = 0 \Rightarrow x = 2$

x	$-\infty$		2		$+\infty$
x^2+1		+		+	
$2-x$		+		−	
x^2-4x+4		+		+	
$\frac{(x^2+1)(2-x)}{x^2-4x+4}$		+		−	

$2 < x < \infty$

Yanıt / The Answer is C

8. $(x-1)^2 = 0 \Rightarrow x = 1$

$x^2 - 6x + 5 = 0$

$(x-5)(x-1) = 0$

$x = 5$ veya (or) $x = 1$

x	$-\infty$		1		5		$+\infty$
$(x-1)^2$		+		+		+	
x^2-6x+5		+		−		+	
$\frac{(x-1)^2}{x^2-6x+5}$		+		−		+	

$1 < x < 5,\ x \in Z \Rightarrow$ ÇK (SS) $= \{2, 3, 4\}$

Yanıt / The Answer is B

9. $\dfrac{(x^2+5)\cdot(x-3)}{|3x+1|} < 0$

$\forall x \in R \Rightarrow x^2 + 5 > 0$

$\forall x \in R \Rightarrow |3x+1| > 0$

$x - 3 < 0$

$x < 3$

$x \in Z \Rightarrow \max(x) = 2$

Yanıt / The Answer is B

10. $\left(\frac{2}{5}\right)^{x^2+4} > \left(\frac{25}{4}\right)^{2x}$

$\left(\frac{2}{5}\right)^{x^2+4} > \left(\frac{2}{5}\right)^{-4x} \Rightarrow x^2 + 4 < -4x$

$x^2 + 4x + 4 < 0$

$x^2 + 4x + 4 = 0$

$x_1 = x_2 = -2$

x	$-\infty$		−2		$+\infty$
x^2+4x+4		+		+	

$\Rightarrow$ ÇK(SS) $= \varnothing$

Yanıt / The Answer is A

11. $x^2 - 3x - 4 = 0 \Rightarrow x_1 = 4,\ x_2 = -1$

$x^2 + 7x + 10 = 0 \Rightarrow x_1 = -2,\ x_2 = -5$

x	$-\infty$		−5		−2		−1		4		$+\infty$
x^2-3x-4		+		+		+		−		+	
$x^2+7x+10$		+		−		+		+		+	

$\Rightarrow$ ÇK(SS) $= \varnothing$

Yanıt / The Answer is A

12. $(x^2-1)\cdot(x+4) > 0$

$x^2 - 1 = 0$

$(x-1)\cdot(x+1) = 0$

$x - 1 = 0$ veya (or) $x + 1 = 0$

$x = 1$ $x = -1$

$x + 4 = 0 \Rightarrow x = -4$

x	$-\infty$		−4		−1		1		$+\infty$
x^2-1		+		+		−		+	
$x+4$		−		+		+		+	
$(x^2-1)(x+4)$		−		+		−		+	

ÇK(SS) $= (-4, -1) \cup (1, \infty)$

Yanıt / The Answer is B

1. $x^2 - 5x - 24 < 0 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is: **(–3, 8)**

2. $x \in Z$,

$x^2 - 6x - 16 < 0 \Rightarrow \sum x = ?$

Yanıt / The Answer is: **27**

3. $2^{2x} - 3 \cdot 2^{x+2} + 32 \leq 0 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is: **[2, 3]**

4. $\dfrac{6-x}{x^2-7x+6} < 0 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is: **(1, ∞) – {6}**

5. $x \in Z$,

$$\frac{(2-x)\cdot(1-x)^2}{(x^2-6x+9)\cdot(x-3)} \geq 0 \Rightarrow \sum x = ?$$

Yanıt / The Answer is: **3**

6. $x \in Z$,

$$\frac{x^2-9x+18}{(x+1)^2} < 0 \Rightarrow \sum x = ?$$

Yanıt / The Answer is: **9**

7. $x \in Z$,

$$\frac{(x-3)^2 \cdot (2-x)}{(x+1)^3 \cdot x^2} \geq 0 \quad \Rightarrow \quad \sum x = ?$$

Yanıt / The Answer is: **6**

8. $x \in Z$,

$$\frac{(x^3+1) \cdot (x^2-4)}{|x-5|} > 0 \quad \Rightarrow \quad \min(x) = ?$$

Yanıt / The Answer is: **3**

9.

$$\left.\begin{aligned} &\frac{x+1}{x-1} < 0 \\ &x^2 - 4x < 5 \end{aligned}\right\} \Rightarrow \text{ÇK(SS)} = ?$$

Yanıt / The Answer is: **(–1, 1)**

10. $x \in Z$,

$$\frac{(x-3)^2 \cdot (x+5)}{x-6} < 0 \quad \Rightarrow \quad \min(x) = ?$$

Yanıt / The Answer is: **–4**

11. $x \in Z$,

$$\left.\begin{aligned} &\frac{x-4}{x+5} < 0 \\ &x^2 - 3x - 18 < 0 \end{aligned}\right\} \Rightarrow \sum x = ?$$

Yanıt / The Answer is: **3**

12. $x \in Z$,

$$\frac{|x^2-16| \cdot (3^x - 27)}{x^2 - 4x - 12} > 0 \quad \Rightarrow \quad \min(x) = ?$$

Yanıt / The Answer is: **–1**

1. $3^{2x} - 10 \cdot 3^x + 9 \leq 0 \Rightarrow$ **ÇK(SS) = ?**

A) [0, 2]
B) [1, 2]
C) [1, 5]
D) [1, 9]
E) [–1, 4]

2. $\frac{4}{x} < \frac{3}{x+1} \Rightarrow$ **ÇK(SS) = ?**

A) (–∞, –1) ∪ (0, 4)
B) (–∞, 0) ∪ (1, 4)
C) (–∞, –4) ∪ (–1, 0)
D) (–∞, 4) ∪ (5, ∞)
E) (–∞, –1) ∪ (2, 4)

3. $\frac{6-x}{x-4} > 1 \Rightarrow$ **ÇK(SS) = ?**

A) (–∞, 4) ∪ (5, 8)
B) (–∞, –4) ∪ (5, ∞)
C) (–4, 5)
D) (4, 5)
E) (–5, 4)

4. $x \in Z$,

$$\frac{x^2+x-12}{-x^2 \cdot (4-x^2)} \geq 0 \Rightarrow \mathbf{min(x) = ?}$$

A) –6
B) –5
C) –4
D) –3
E) –2

5. $m \in N$,
$x_1 + x_2 > 0$,
$(m-2)x^2 - 3(m-1)x + 7 = 0 \Rightarrow$ **min(m) = ?**

A) 0
B) 1
C) 2
D) 3
E) 4

6. $x \in Z$,

$$\frac{x^3-x}{2-x} \geq 0 \Rightarrow \sum x = ?$$

A) –4
B) –3
C) –2
D) –1
E) 0

7. $x \in Z$,

$$\frac{x-3}{-x^2-4} < 0 \Rightarrow \mathbf{min(x) = ?}$$

A) –1

B) 1

C) 2

D) 3

E) 4

8. $x \in Z$,

$$\frac{x^2+5x}{x^2+8x} < \frac{5x+64}{x^2+8x} \Rightarrow \mathbf{min(x) = ?}$$

A) –2

B) –1

C) 0

D) 1

E) 2

9. $x \in Z^-$,

$$\frac{x^2-x}{3} \geq 4 \Rightarrow \mathbf{max(x) = ?}$$

A) –5

B) –3

C) –1

D) 1

E) 4

10. $x \in Z$,

$$\frac{4}{x-2} + \frac{x}{x+2} < \frac{8}{x^2-4} \Rightarrow \mathbf{\sum x = ?}$$

A) 1

B) 5

C) 9

D) 15

E) 18

11. $x \in R^+$,

$$\frac{(x^2-16)\cdot(x^2-8x+16)}{(x^2+6x+9)\cdot(x^2-9)} < 0 \Rightarrow \mathbf{ÇK(SS) = ?}$$

A) (–4, 3)

B) (–3, 4)

C) (–3, 3)

D) (3, 4)

E) (4, 5)

12. $$\left(\frac{1}{2}\right)^{x^2-2x} \leq \frac{1}{8} \Rightarrow \mathbf{ÇK(SS) = ?}$$

A) (–∞, –1] ∪ [3, ∞)

B) (–∞, –3] ∪ [1, ∞)

C) (–3, 1]

D) [–1, 3]

E) [–4, 1)

YANITLAR / ANSWERS

1. A	**2. C**	**3. D**	**4. C**	**5. D**	**6. E**	**7. E**	**8. D**
9. B	**10. A**	**11. D**	**12. A**				

1. $x \in Z$,

$(4x-2)\cdot(3x-9) \le 0 \Rightarrow$ **min(x) = ?**

A) –5
B) –3
C) –1
D) 1
E) 3

2. $x \in Z$,

$$\frac{-x^2\cdot(x^2-5x+6)}{x^2-4} > 0 \Rightarrow \sum x = ?$$

A) 0
B) 3
C) 4
D) 6
E) 9

3. $x \in Z$,

$$\frac{(x^2-4x-5)\cdot(x+1)^2}{x^2-6x+9} \le 0 \Rightarrow \sum x = ?$$

A) 9
B) 10
C) 11
D) 12
E) 14

4. $x \in Z$,

$$\frac{(2-x)\cdot(x-2)}{x^2-4} \ge 0 \Rightarrow \mathbf{min(x) = ?}$$

A) 7
B) 4
C) 2
D) –1
E) –3

5. $$\frac{(-x+5)^2\cdot(x^4+5)}{x^2-6x+8} < 0 \Rightarrow \text{ÇK(SS)} = ?$$

A) (2, 4)
B) (3, 7)
C) (4, 8)
D) (3, 5)
E) (2, 1)

6. $x \in Z$,

$x^2\cdot(7x-4) < x(x-2) \Rightarrow$ **max(x) = ?**

A) 6
B) 3
C) 2
D) –1
E) –5

7. $x \in Z$,

$\frac{4}{x} < x \Rightarrow$ **min(x) = ?**

A) –2

B) –1

C) 0

D) 1

E) 2

8. $\frac{(16-x^2)\cdot(x^3-1)}{x^2-1} < 0 \Rightarrow$ **ÇK(SS) = ?**

A) (–4, –1) ∪ (4, ∞)

B) (–∞, –4) ∪ [1, 4)

C) (–4, –1) ∪ (1, 4)

D) (–4, 1) ∪ (4, ∞)

E) (–∞, –4) ∪ (4, ∞)

9. $x \in Z$,

$\frac{4^x \cdot (x^2-2x+5)}{x^2-5x-14} < 0 \Rightarrow$ **$\sum x$ = ?**

A) 15

B) 18

C) 20

D) 24

E) 27

10. $\frac{(x-2)^{2000}\cdot(x+1)^{1999}}{(x-1)^{1998}} < 0 \Rightarrow$ **ÇK(SS) = ?**

A) (–∞, –1)

B) (0, 2)

C) (1, 2)

D) (–∞,1)

E) (–2, –1)

11. $x \in Z$,

$\frac{|x-2|\cdot(x^2-4x+3)}{(2^x-4)} > 0 \Rightarrow$ **min(x) = ?**

A) 0

B) 1

C) 2

D) 3

E) 4

12. $\left.\begin{array}{l} x^2-x<12 \\ \frac{x+1}{x-1}<0 \end{array}\right\} \Rightarrow$ **ÇK(SS) = ?**

A) (0, 4)

B) (–1, 4)

C) (1, 4)

D) (–3, –1)

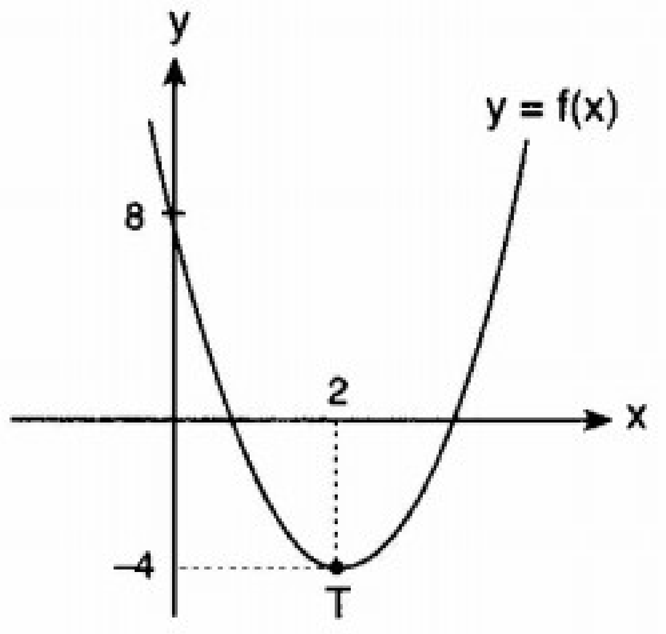
E) (–1, 1)

YANITLAR / ANSWERS

1. D	**2. A**	**3. C**	**4. D**	**5. A**	**6. D**	**7. B**	**8. A**
9. C	**10. A**	**11. E**	**12. E**				

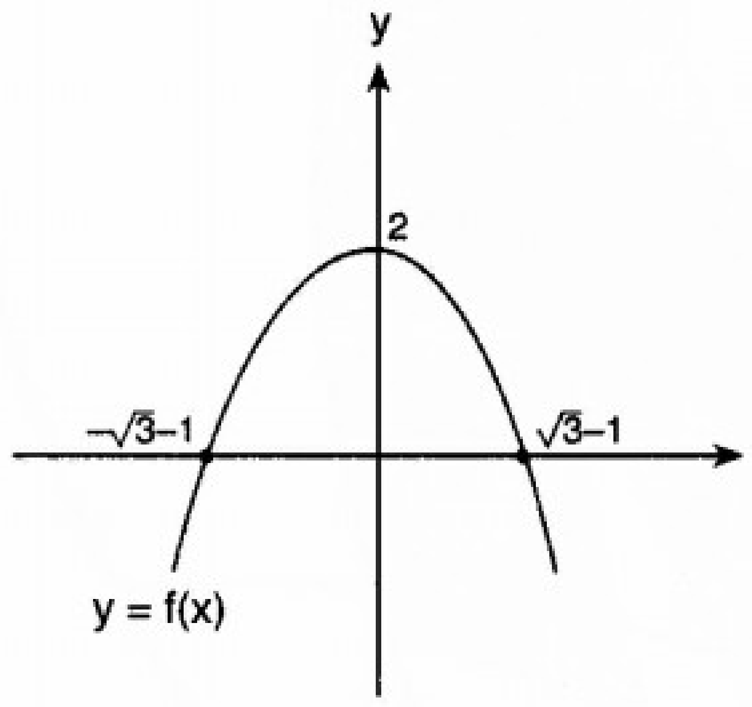
1. **$f(1) = ?$**

A) -1
B) -3
C) -5
D) -7
E) -9



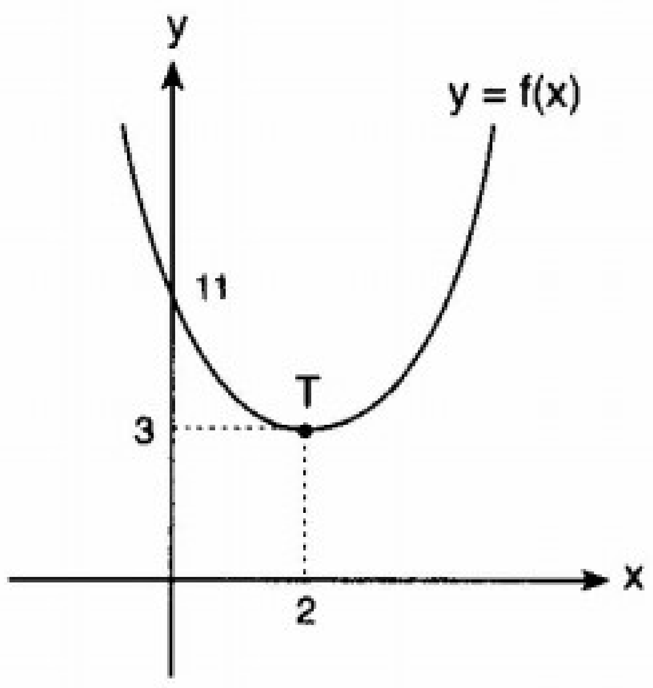
2. **$f(1) = ?$**

A) -1
B) -2
C) -3
D) -4
E) -5


y
2
$-\sqrt{3}-1$
$\sqrt{3}-1$
y = f(x)

3. **$f(3) = ?$**

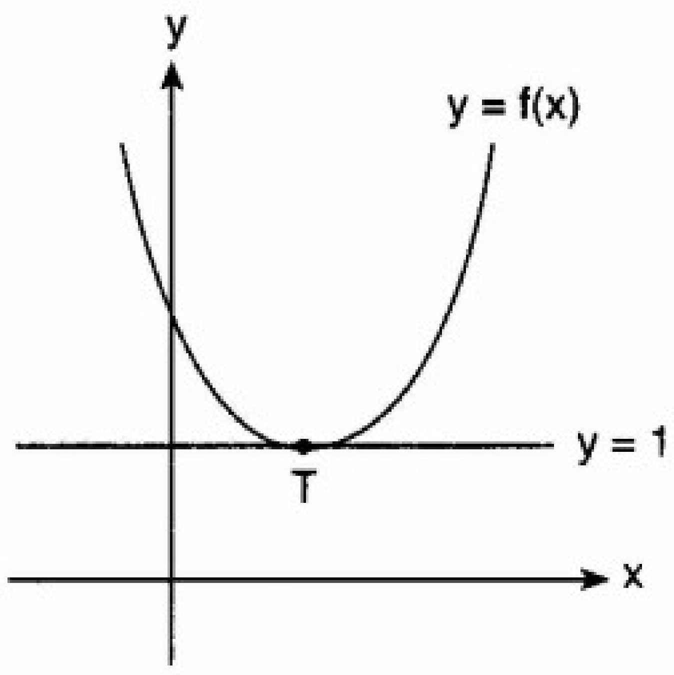
A) 4
B) 5
C) 6
D) 7
E) 8


y
y = f(x)
11
T
3
2
x

4. $f(x) = mx^2 - 2mx + 3$

$\Rightarrow$ **$m = ?$**

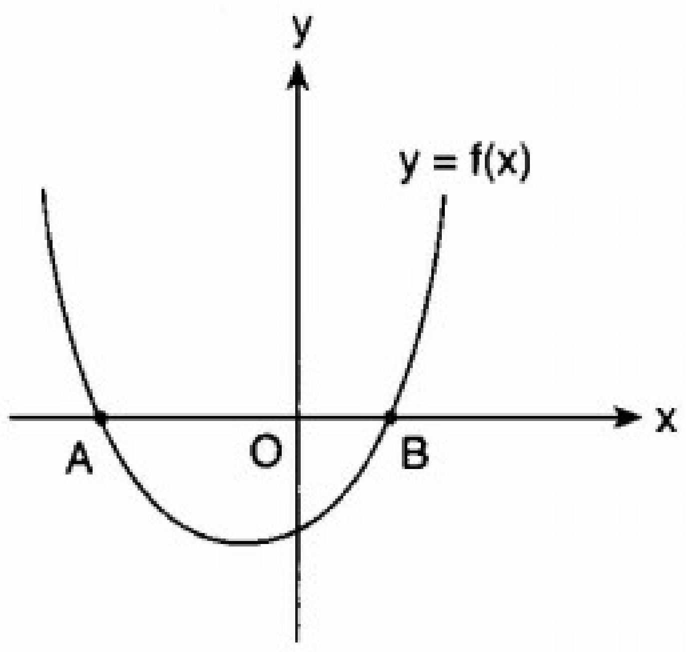
A) 2
B) 4
C) 6
D) 8
E) 10



5. $y = x^2 + 4x - 8m,$

$|AO| = 2|OB| \Rightarrow$ **$m = ?$**

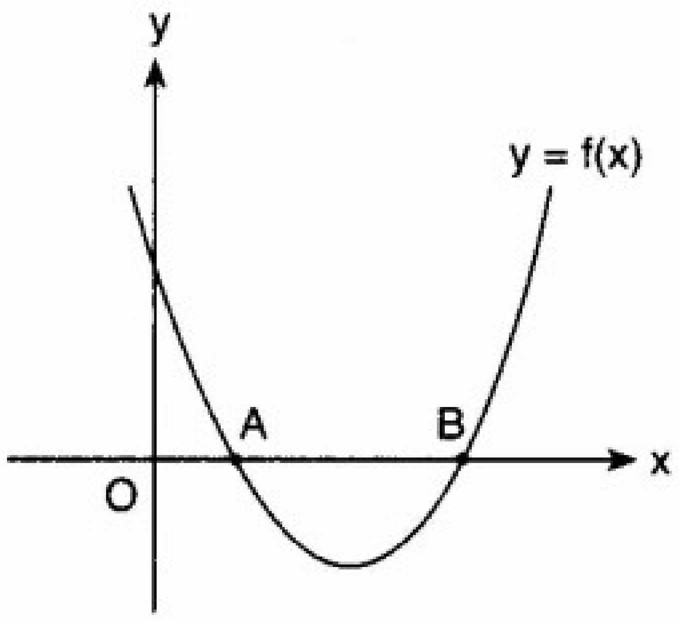
A) 1
B) 2
C) 3
D) 4
E) 5



6. $f(x) = 2x^2 - 16x + m,$

$2|OA| = 3|AB| \Rightarrow$ **$m = ?$**

A) 27
B) 30
C) 32
D) 36
E) 39



7. **Taralı Alan**

The Shaded Area = ?

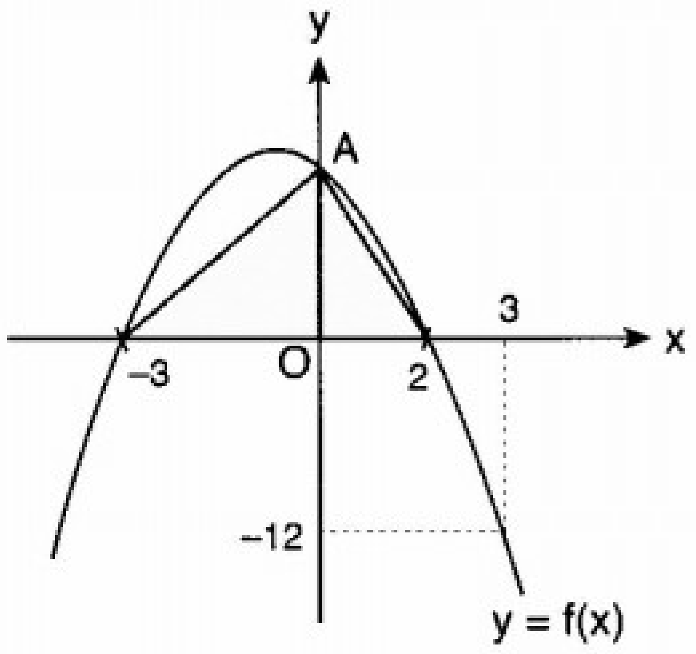
A) 24

B) 27

C) 28

D) 30

E) 32


y
A
3
x
–3
O
2
–12
y = f(x)

8. $f(x) = ax^2 + bx + c$

$\Rightarrow$ **a + b + c = ?**

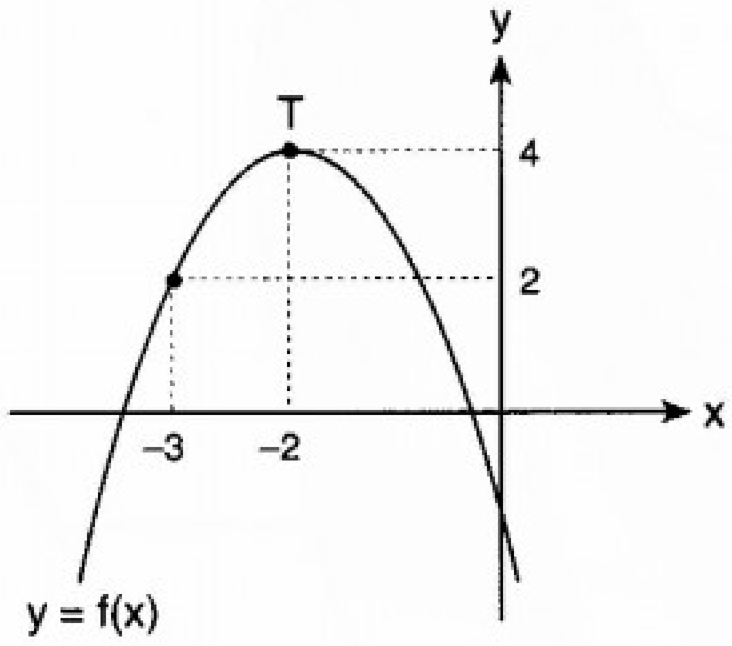
A) –6

B) –8

C) –10

D) –12

E) –14


y
T
4
2
x
–3
–2
y = f(x)

9. **m = ?**

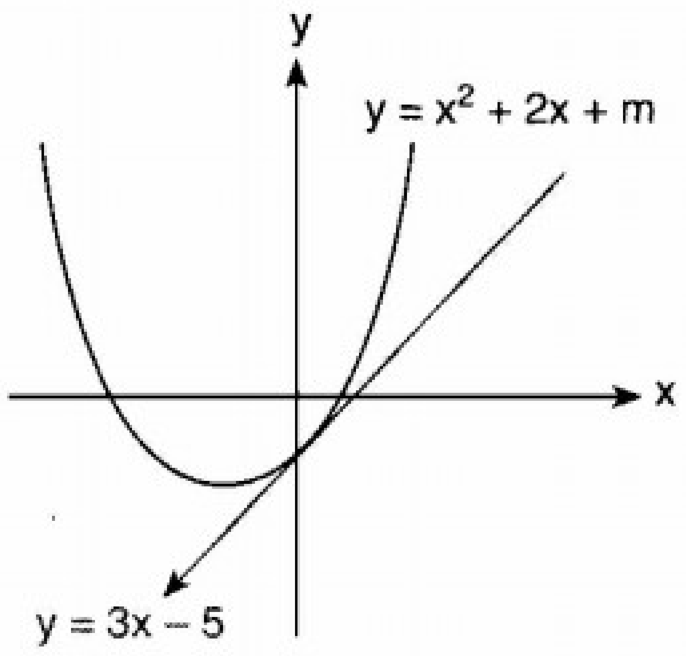
A) $-\frac{11}{4}$

B) $-\frac{13}{4}$

C) $-\frac{15}{4}$

D) $-\frac{17}{4}$

E) $-\frac{19}{4}$


y
y = x² + 2x + m
x
y = 3x – 5

10. **a·b = ?**

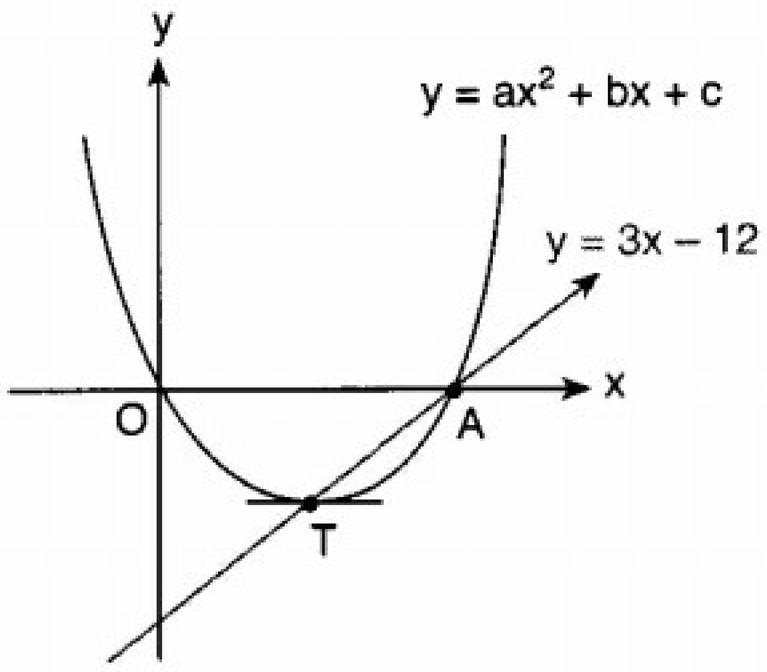
A) –9

B) –10

C) –11

D) –12

E) –13


y
y = ax² + bx + c
y = 3x – 12
x
O
A
T

11. $y = 2x^2 - 12x + 10$

taralı alan

the shaded area **= ?**

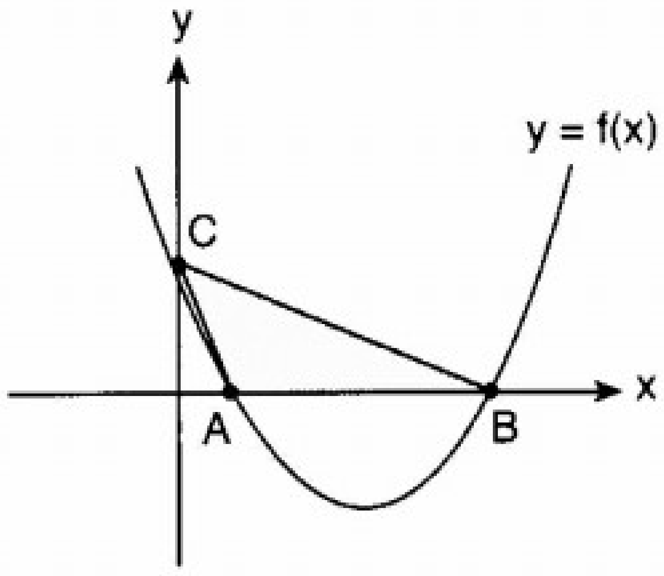
A) 20

B) 30

C) 40

D) 50

E) 60



12. $m \in Z \Rightarrow$ **max(m) = ?**

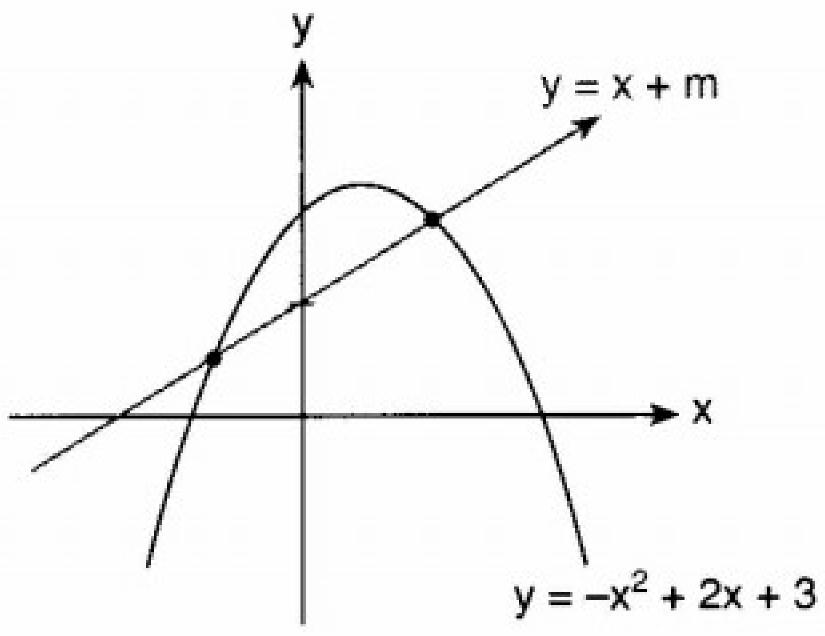
A) 1

B) 2

C) 3

D) 4

E) 5


y
y = x + m
x
y = –x² + 2x + 3

YANITLAR / ANSWERS

1. A	**2. A**	**3. B**	**4. A**	**5. D**	**6. B**	**7. D**	**8. E**
9. E	**10. A**	**11. A**	**12. C**				

1. $y = a\cdot(x - r)^2 + k$

$= a\cdot(x - 2)^2 + (-4)$

$= a(x^2 - 4x + 4) + (-4)$

$= ax^2 - 4ax + 4a - 4$

$4a - 4 = 8 \Rightarrow a = 3$

$f(x) = 3x^2 - 12x + 8$

$f(1) = 3 - 12 + 8 = -1$

Yanıt / The Answer is A

2. $f(x) = a(x + (\sqrt{3} + 1))\cdot(x - (\sqrt{3} - 1))$

$= a(x^2 - x(\sqrt{3} - 1) + x(\sqrt{3} + 1) - 2)$

$= a(x^2 + 2x - 2)$

$= ax^2 + 2ax - 2a$

$-2a = 2 \Rightarrow a = -1$

$f(x) = -x^2 - 2x + 2$

$f(1) = -1 - 2 + 2 = -1$

Yanıt / The Answer is A

3. $f(x) = a\cdot(x - r)^2 + k$

$= a\cdot(x - 2)^2 + 3$

$= ax^2 - 4ax + 4a + 3$

$4a + 3 = 11 \Rightarrow a = 2$

$f(3) = 5$

Yanıt / The Answer is B

4. $\left.\begin{array}{l} y = mx^2 - 2mx + 3 \\ y = 1 \end{array}\right\} \Rightarrow mx^2 - 2mx + 3 = 1$

$mx^2 - 2mx + 2 = 0$

$\Delta = 0 \Rightarrow 4m^2 - 4(m\cdot 2) = 0$

$4m^2 - 8m = 0$

$m = 2$

Yanıt / The Answer is A

5. $|AO| = 2\cdot|OB| \Rightarrow |AO| = 2k$

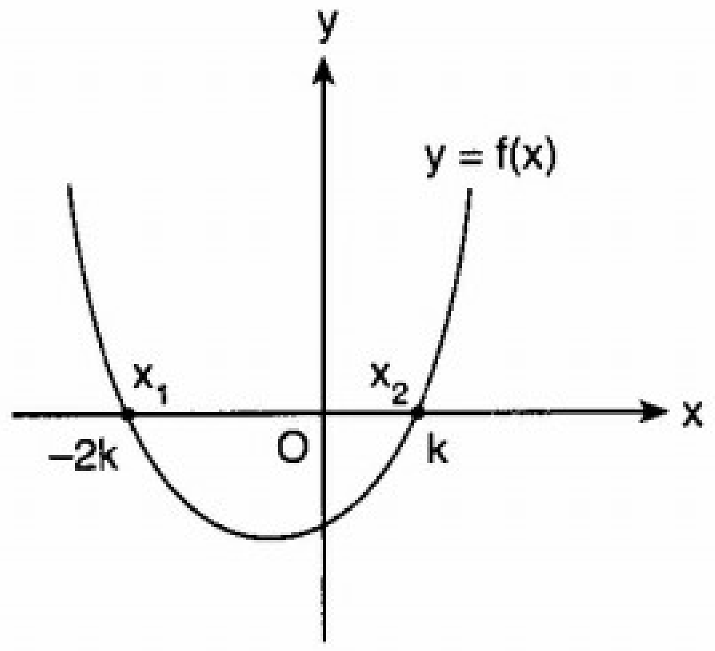
$|OB| = k$

$x_1 + x_2 = -2k + k = -\frac{b}{a}$

$x_1 \cdot x_2 = -2k\cdot k = -32$

$\frac{-8m}{1} = -32$

$m = 4$



Yanıt / The Answer is D

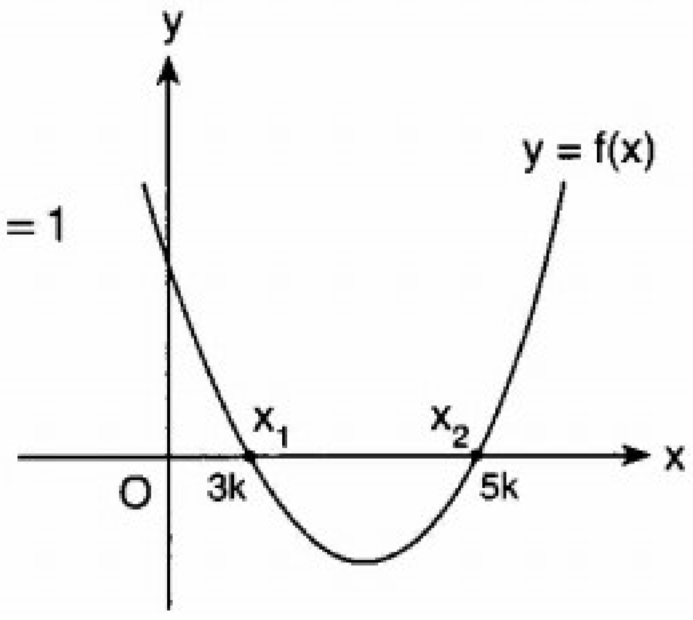
6. $2\cdot|OA| = 3\cdot|AB| \Rightarrow |OA| = 3k$

$|AB| = 2k$

$x_1 + x_2 = 3k + 5k = 8k = \frac{16}{2} \Rightarrow k = 1$

$x_1 \cdot x_2 = 3\cdot 5 = 15 = \frac{m}{2}$

$m = 30$



Yanıt / The Answer is B

7. $f(x) = a\cdot(x-2)\cdot(x+3)$

$= a\cdot(x^2 + x - 6)$

$= ax^2 + ax - 6a$

$(3, -12) \in f(x) \Rightarrow -12 = a\cdot 9 + 3a - 6a$

$f(x) = -2x^2 - 2x + 12 \Rightarrow |OA| = 12$

$TA/SA = \dfrac{12\cdot 5}{2} = 30\ br^2/u^2$

Yanıt / The Answer is D

8. $f(x) = a\cdot(x-r)^2 + k$

$= a\cdot(x+2)^2 + 4$

$= a\cdot(x^2 + 4x + 4) + 4$

$= ax^2 + 4ax + 4a + 4$

$(-3, 2) \in f(x) \Rightarrow 2 = 9a - 12a + 4a + 4$

$a = -2$

$f(x) = -2x^2 - 8x - 4$

$\Rightarrow a + b + c = -2 - 8 - 4 = -14$

Yanıt / The Answer is E

9. $\left.\begin{array}{l} y = x^2 + 2x + m \\ y = 3x - 5 \end{array}\right\} \Rightarrow x^2 + 2x + m = 3x - 5$

$x^2 - x + m + 5 = 0$

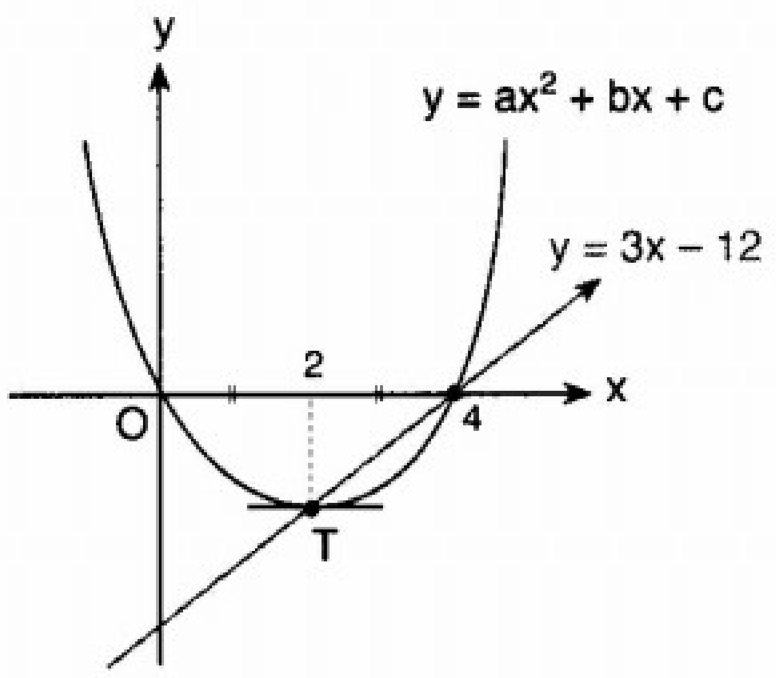
$\Delta = 0 \Rightarrow (-1)^2 - 4\cdot 1\cdot(m+5) = 0$

$1 - 4m - 20 = 0$

$m = -\dfrac{19}{4}$

Yanıt / The Answer is E

10.



$y = 3x - 12 = 0$

$x = 4$

$x = 4 \Rightarrow T(2, -6)$

$-\dfrac{b}{2a} = 2 \Rightarrow -b = 4a$

$f(x) = a(x)\cdot(x-4) = a(x^2 - 4x)$

$= ax^2 - 4ax \Rightarrow -6 = 4a - 8a \Rightarrow a = \dfrac{3}{2}$

$b = -4\cdot\dfrac{3}{2} = -6$

$a\cdot b = \dfrac{3}{2}\cdot -6 = -9$

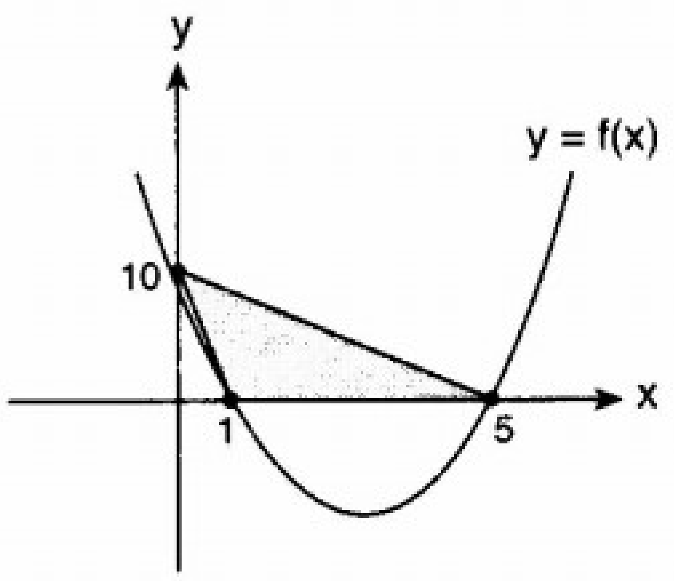
Yanıt / The Answer is A

11. $2x^2 - 12x + 10 = 0$

$x = 5,\ x = 1 \Rightarrow$

$A(1, 0),\ B(5, 0),\ C(10, 0)$

$TA/SA = \dfrac{10\cdot 4}{2} = 20\ br^2/u^2$



Yanıt / The Answer is A

12. $-x^2 + 2x + 3 = x + m$

$-x^2 - x + 3 - m = 0$

$\Delta > 0 \Rightarrow (-1)^2 - 4\cdot(-1)\cdot(3-m) > 0$

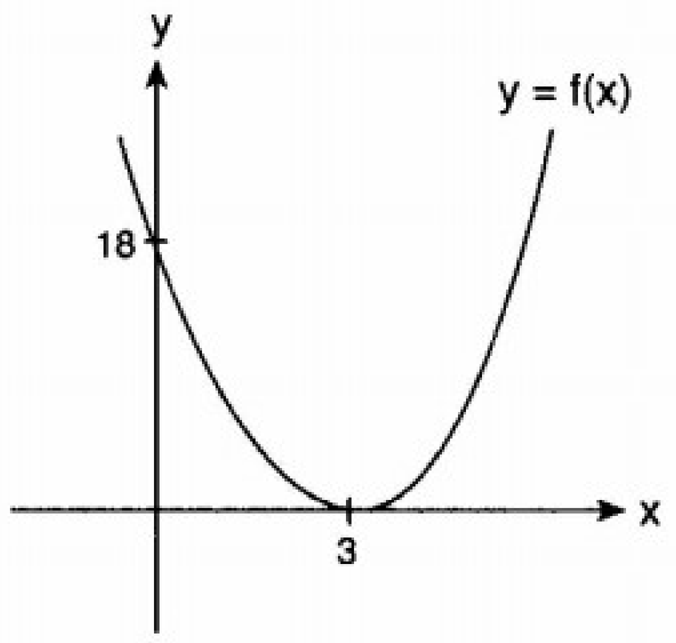
$1 + 12 - 4m > 0$

$13 > 4m$

$\Rightarrow \max(m) = 3$

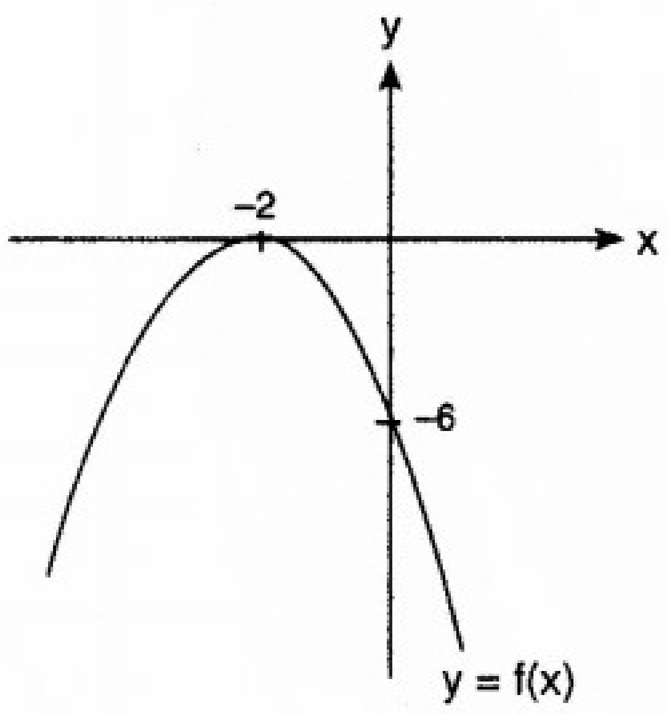
Yanıt / The Answer is C

1. $f(4) = ?$



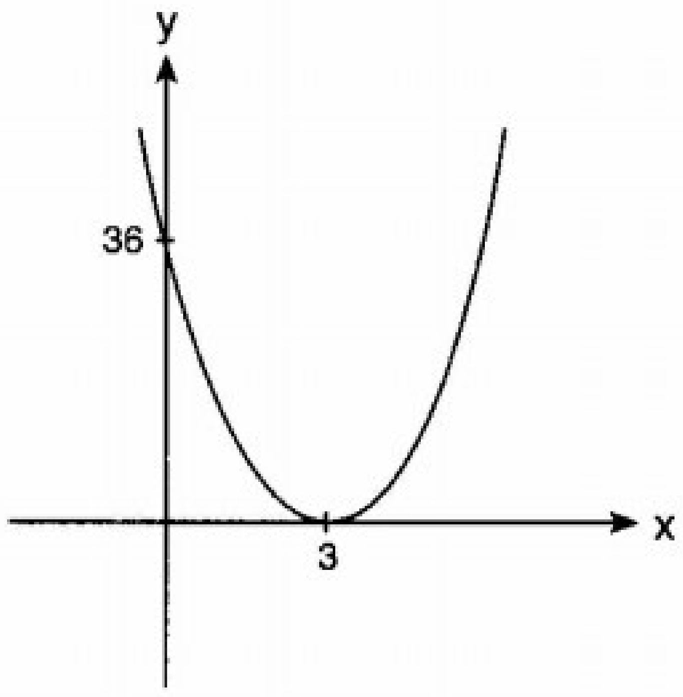
Yanıt / The Answer is: **2**

2. $f(2) = ?$



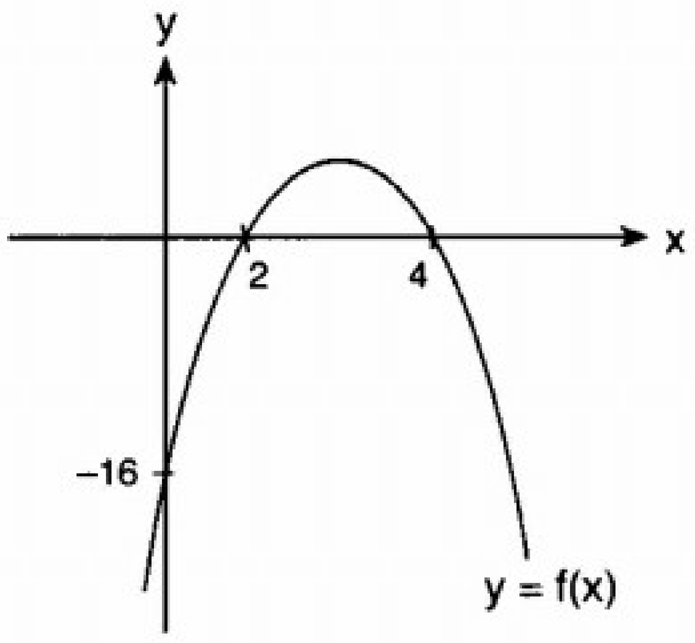
Yanıt / The Answer is: **–24**

3. $f(1) = ?$



Yanıt / The Answer is: **16**

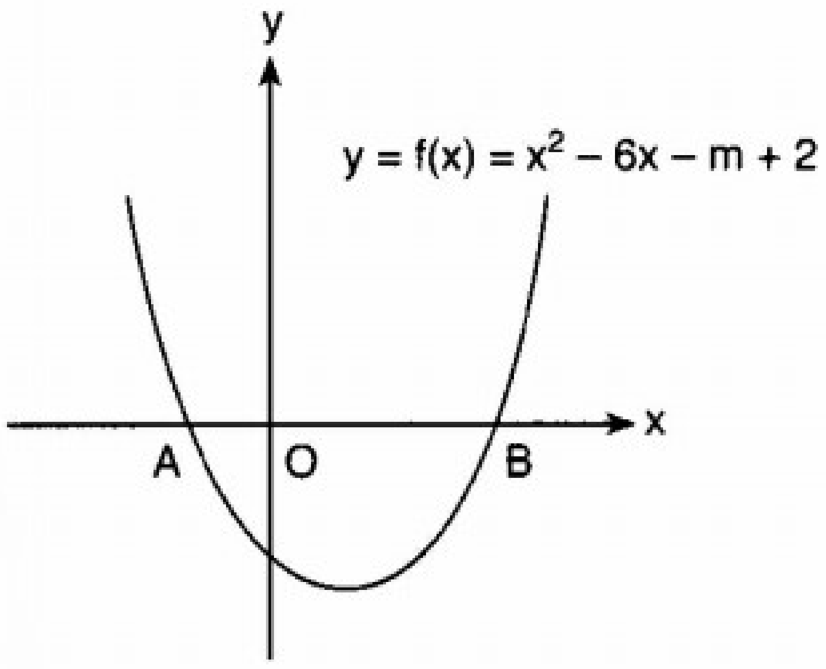
4. $\max(f(x)) = ?$



Yanıt / The Answer is: **2**

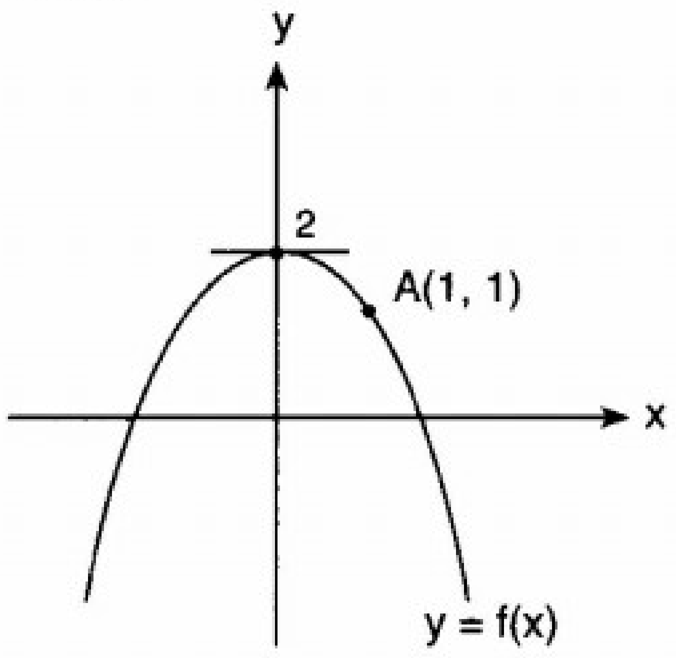
5. $|OB| = 7 \cdot |OA|$

$\Rightarrow$ **m = ?**



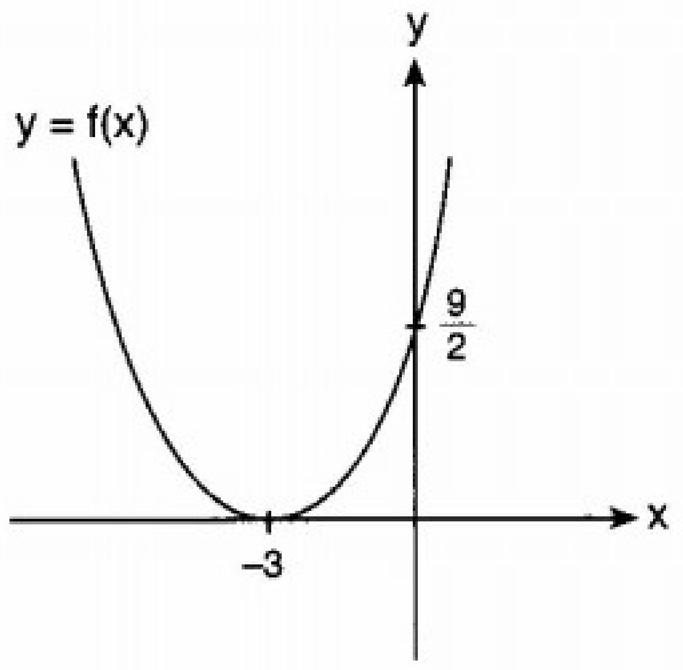
Yanıt / The Answer is: **9**

6. $f(2) = ?$



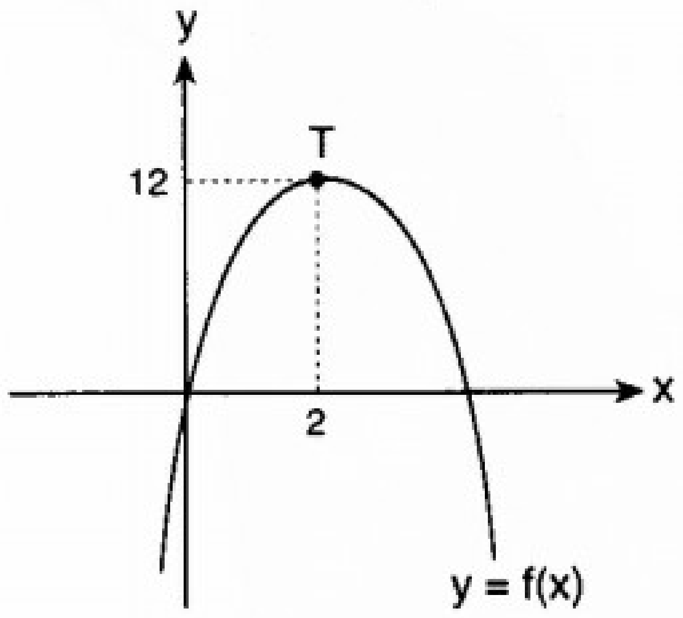
Yanıt / The Answer is: **–2**

7. $f(1) = ?$



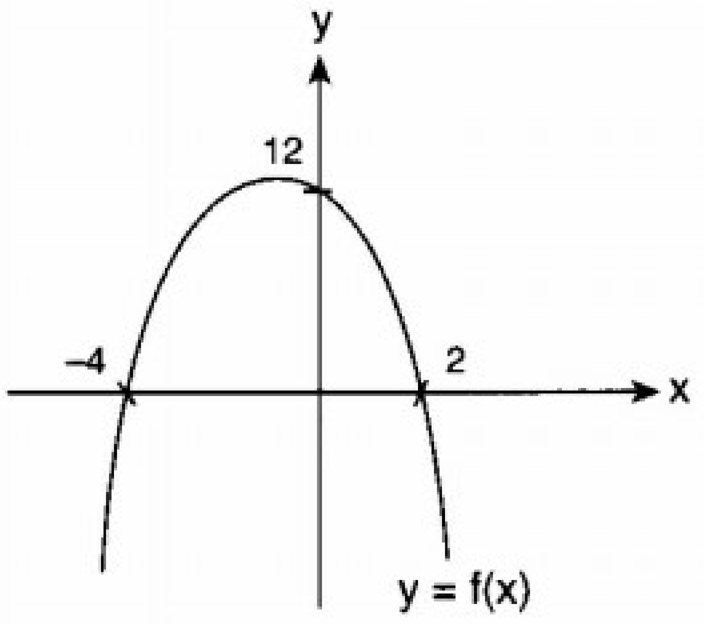
Yanıt / The Answer is: **8**

8. $f(1) = ?$



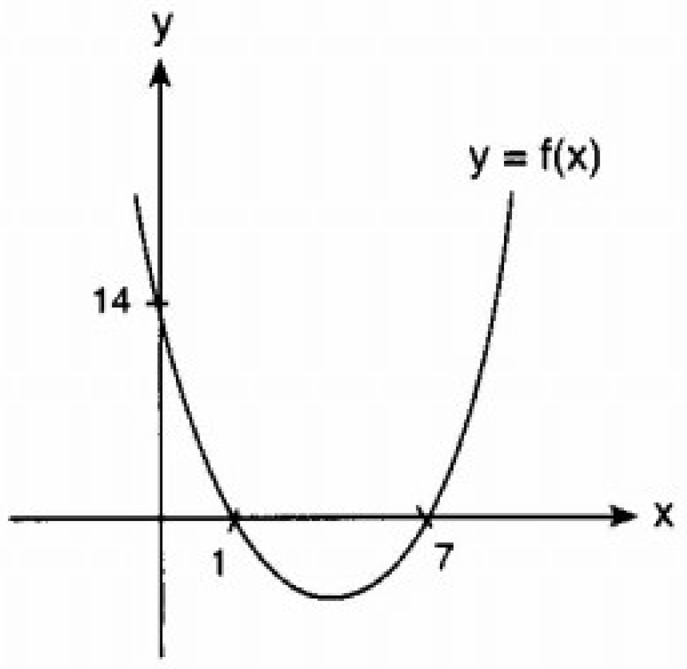
Yanıt / The Answer is: **9**

9. $f(-1) = ?$



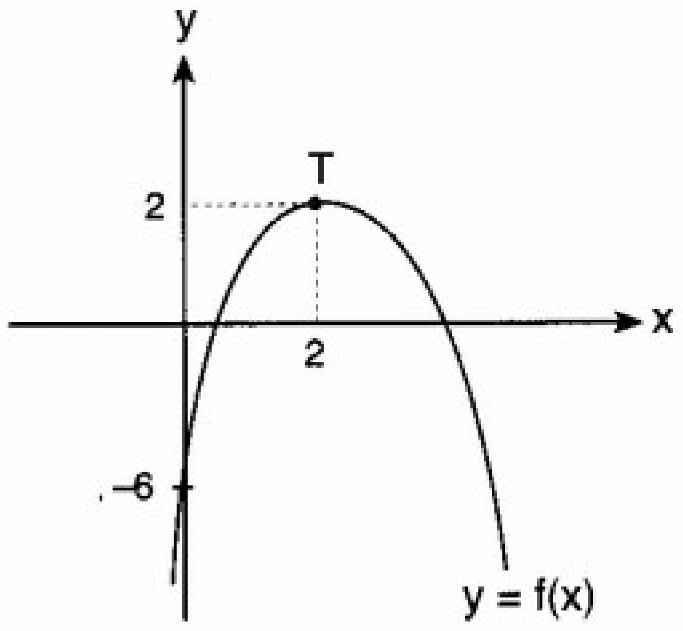
Yanıt / The Answer is: $\frac{27}{2}$

10. $\min(f(x)) = ?$



Yanıt / The Answer is: **–18**

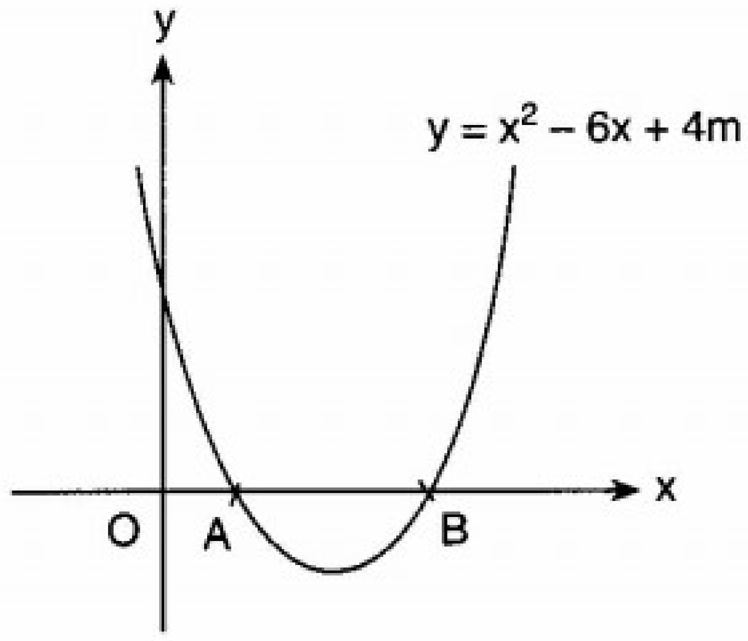
11. $f(4) = ?$



Yanıt / The Answer is: **–6**

12. $|OA| = m$

$\Rightarrow$ **$m = ?$**



Yanıt / The Answer is: **2**

1. $y = x^2 - 6x + 3 \Rightarrow$ **min(y) = ?**

A) 0

B) -2

C) -4

D) -6

E) -8

2. $y = x^2 + 4x - 2 \Rightarrow$ **min(y) = ?**

A) -6

B) -5

C) -4

D) -3

E) -2

3. $y = -x^2 + 2x + 5 \Rightarrow$ **max(y) = ?**

A) 3

B) 4

C) 6

D) 7

E) 9

4. $y = -x^2 + 4x - 1 \Rightarrow$ **max(y) = ?**

A) 0

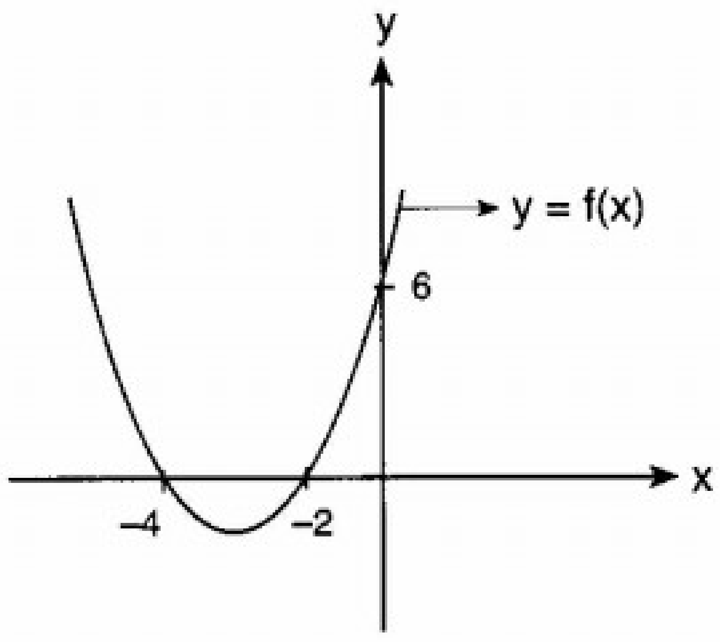
B) 1

C) 2

D) 3

E) 4

5. **min(y) = ?**



A) $\frac{1}{4}$

B) $-\frac{1}{4}$

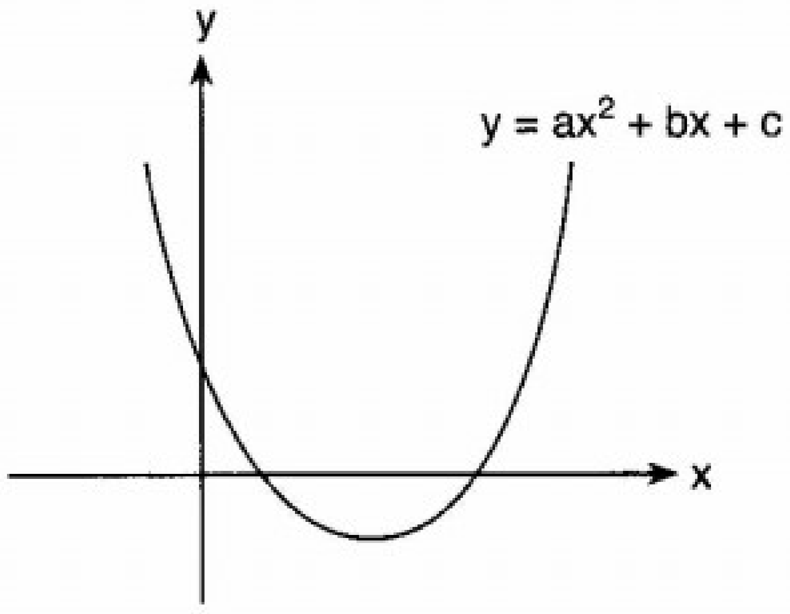
C) $-\frac{3}{4}$

D) $-\frac{5}{4}$

E) $-\frac{7}{4}$

6. **Aşağıdakilerden hangisi doğrudur?**

Which of the following is true?



A) $c < 0$

B) $\frac{b}{a} < 0$

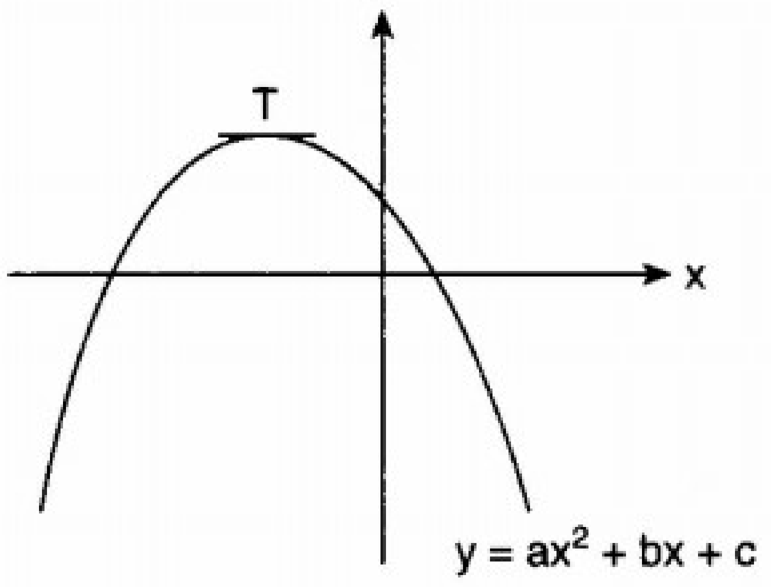
C) $a \cdot c < 0$

D) $\frac{c}{b} > 0$

E) $a + c < 0$

7. **Aşağıdakilerden hangisi doğrudur?**

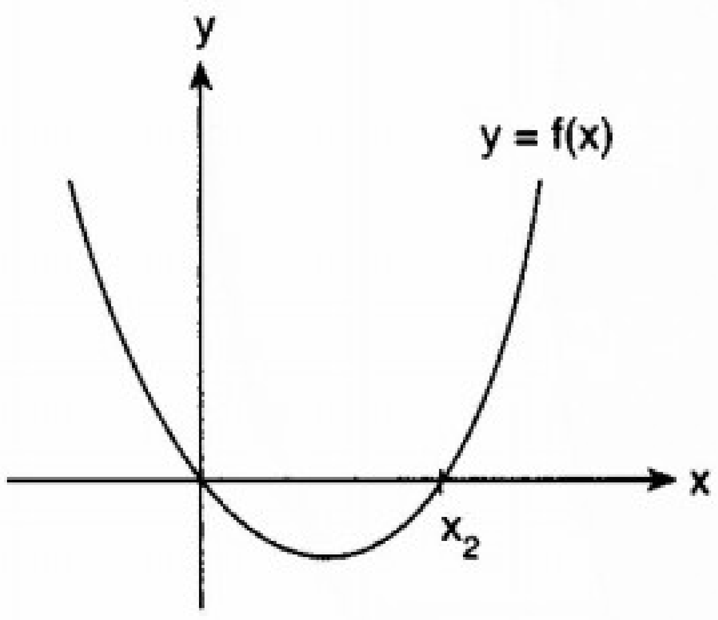
Which of the following is true?


y
T
x
$y = ax^2 + bx + c$

A) $c < 0$ B) $a \cdot b \cdot c < 0$ C) $\frac{b}{c} > 0$

D) $a \cdot c < 0$ E) $a + b > 0$

8.



$f(x) = (m-1)x^2 - 4x + m - 2 \Rightarrow$ **x_2 = ?**

A) 1 B) 2 C) 3

D) 4 E) 5

9. $f(x) = mx^2 - 4x - 3m$

$\Rightarrow$ **c = ?**

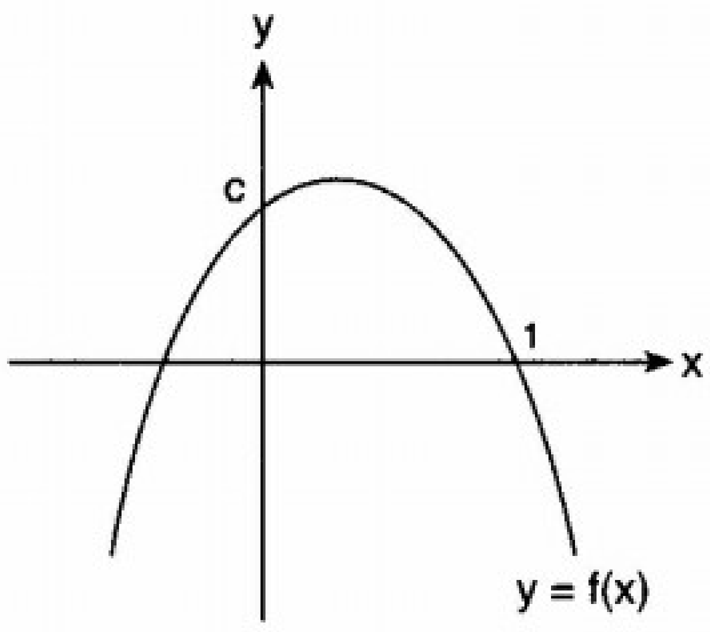
A) –4

B) –2

C) 2

D) 4

E) 6



10. **f(4) = ?**

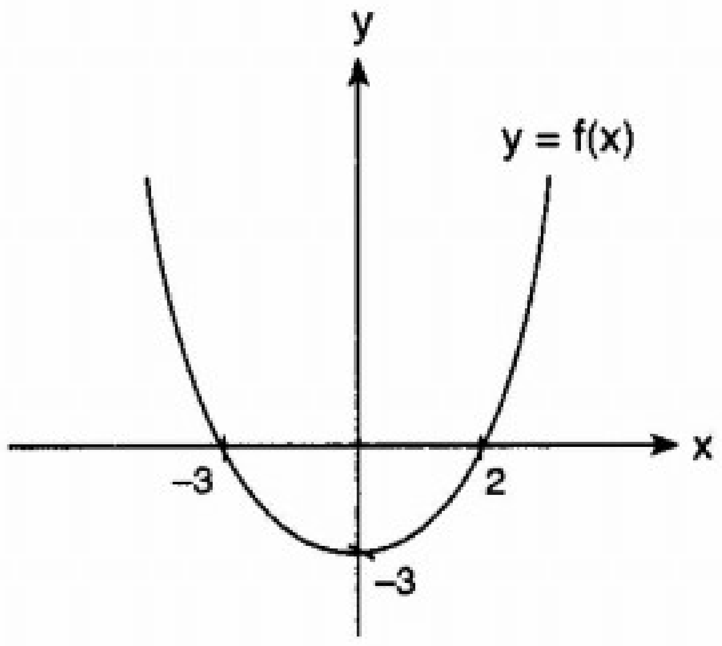
A) 6

B) 7

C) 8

D) 9

E) 10



11. $f(x) = mx^2 - 4x - 3m$

$\Rightarrow$ **m = ?**

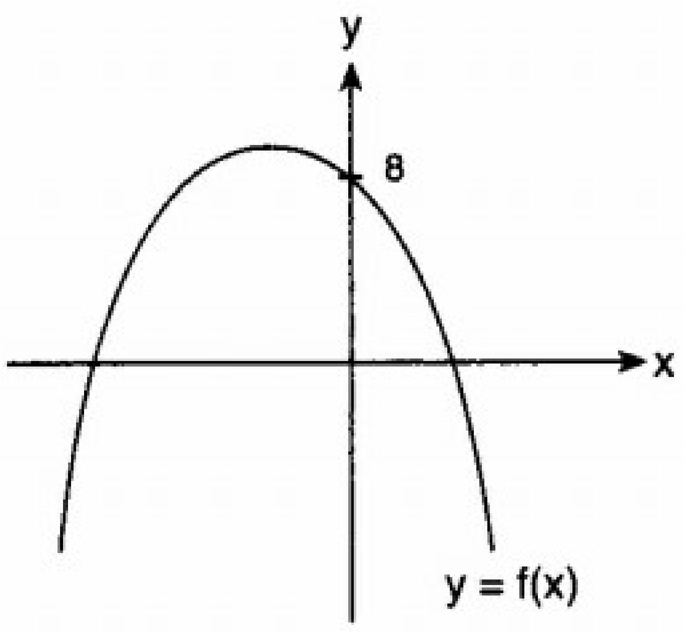
A) $\frac{8}{3}$

B) $\frac{7}{3}$

C) $-\frac{4}{3}$

D) -2

E) $-\frac{8}{3}$



12. **f(8) = ?**

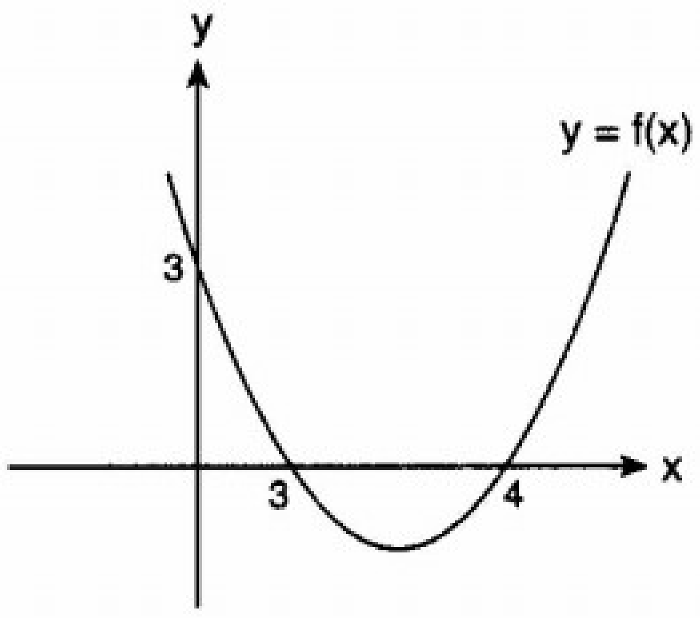
A) 2

B) 4

C) 5

D) 8

E) 9



YANITLAR / ANSWERS							
1. D	**2. A**	**3. C**	**4. D**	**5. C**	**6. B**	**7. D**	**8. D**
9. E	**10. B**	**11. E**	**12. C**				

1. $f(x) = ax^2 + bx + c = ?$

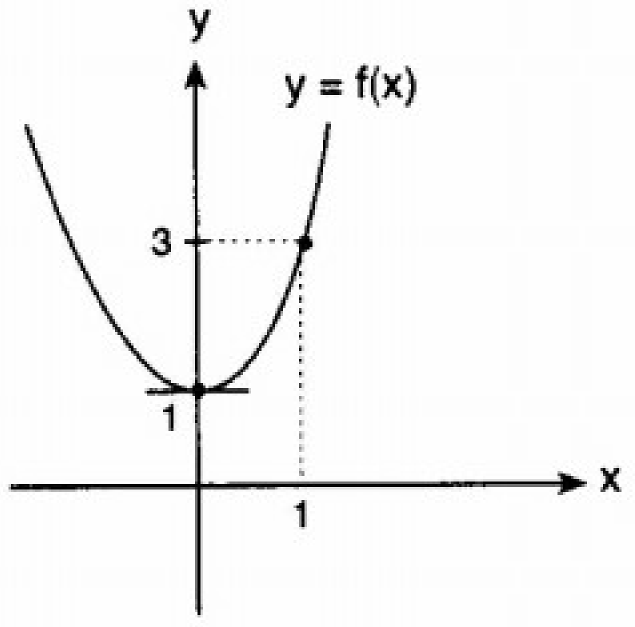
A) $3x^2$

B) $2x^2 + 1$

C) $4x^2 - 1$

D) $x^2 + 2x$

E) $2x^2 - x + 1$



2. $f(x) = ax^2 + bx + c$

$\Rightarrow$ **$a + b + c = ?$**

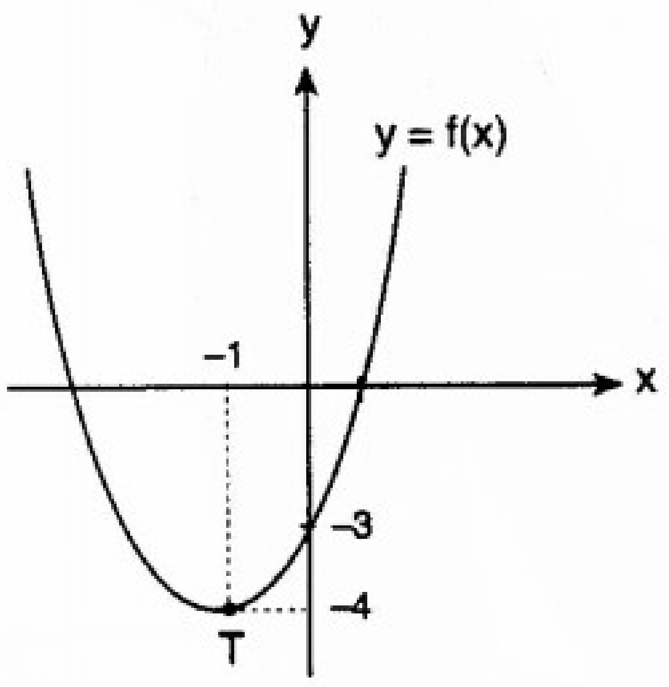
A) –2

B) –1

C) 0

D) 1

E) 2



3. $f(-2) = ?$

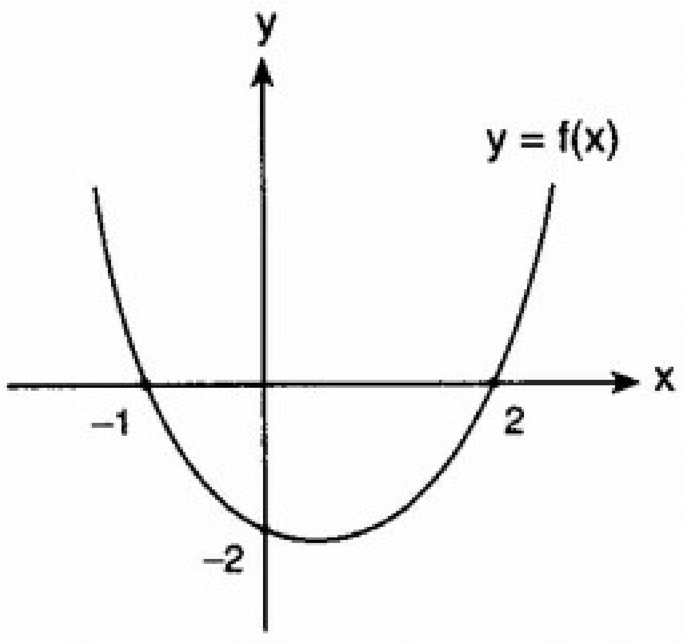
A) 0

B) 2

C) 4

D) 6

E) 8



4. $f(1) = ?$

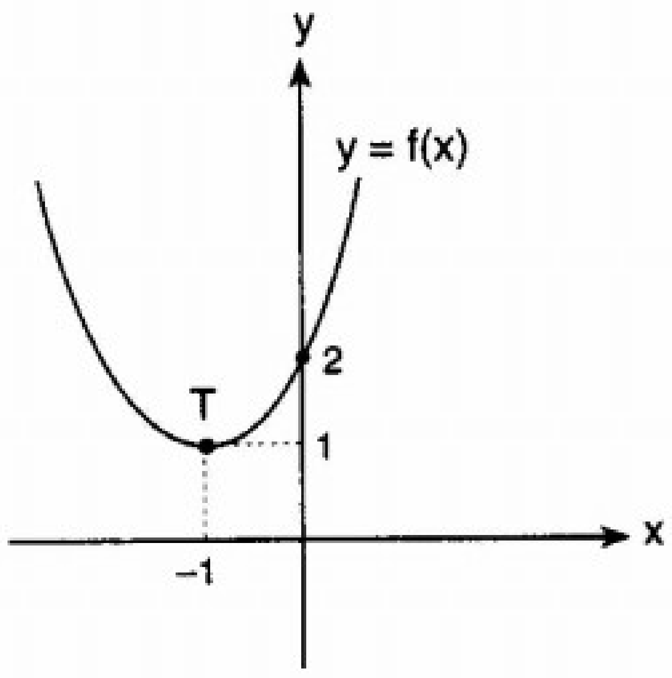
A) 2

B) 3

C) 4

D) 5

E) 6



5. $f(3) = ?$

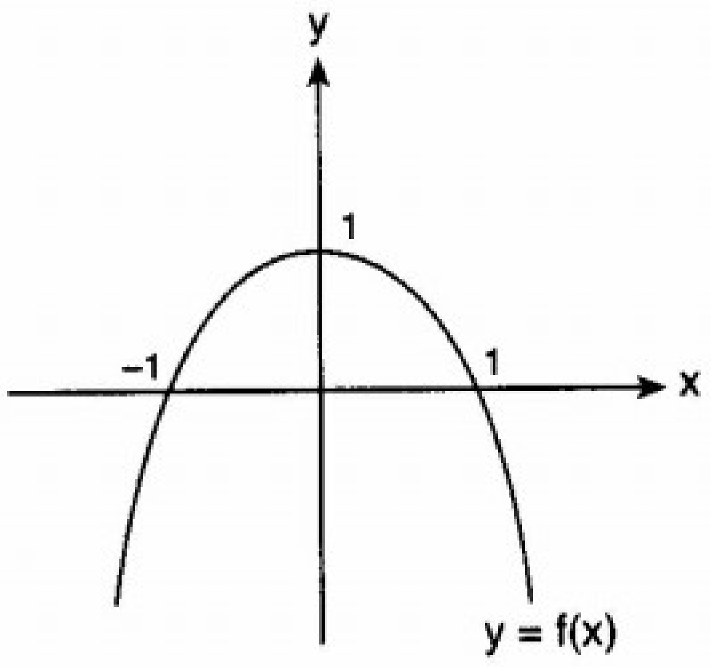
A) –8

B) –10

C) –12

D) –14

E) –16



6. $f(1) = ?$

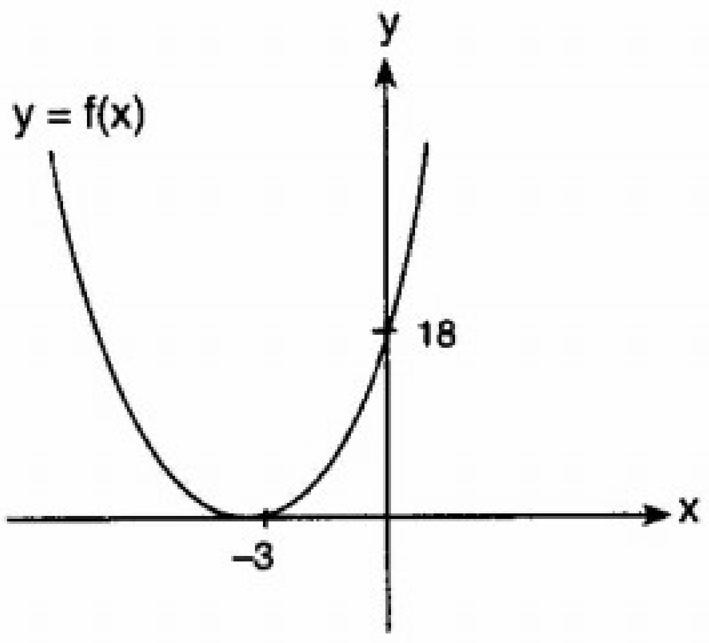
A) 19

B) 20

C) 24

D) 27

E) 32



7. **$f(3) = ?$**

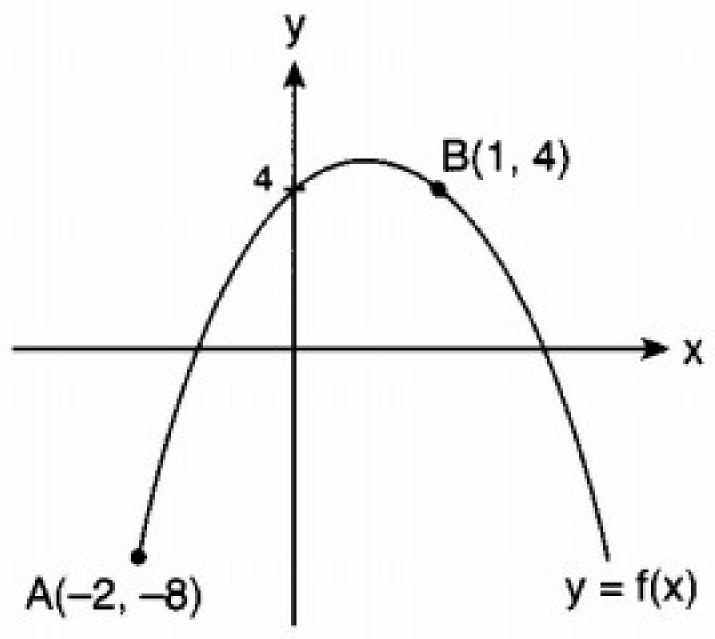
A) -6

B) -8

C) -10

D) -12

E) -14


y
4
B(1, 4)
x
A(–2, –8)
y = f(x)

8. **$f(-1) = ?$**

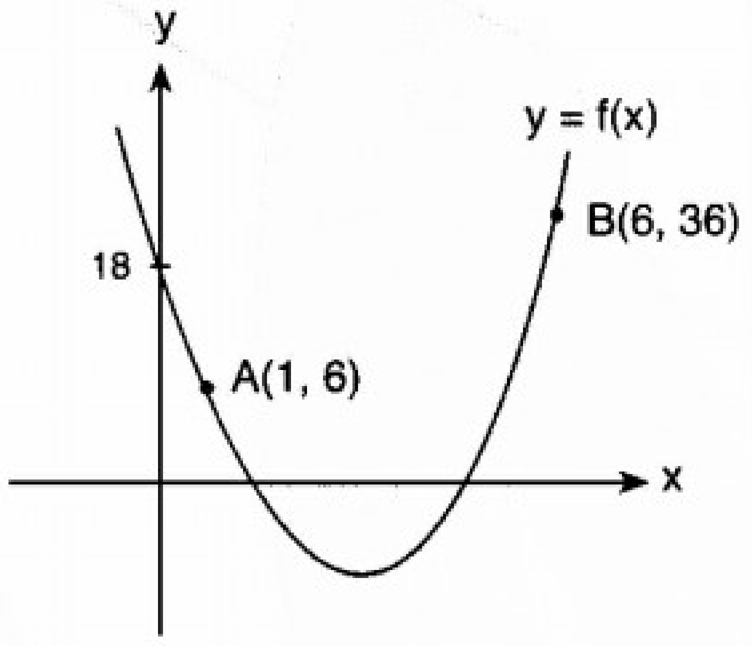
A) 32

B) 36

C) 38

D) 40

E) 42


y
y = f(x)
B(6, 36)
18
A(1, 6)
x

9. $A(x_1, y_1)$, $B(x_2, y_2)$

$\Rightarrow$ **$x_1 + x_2 = ?$**

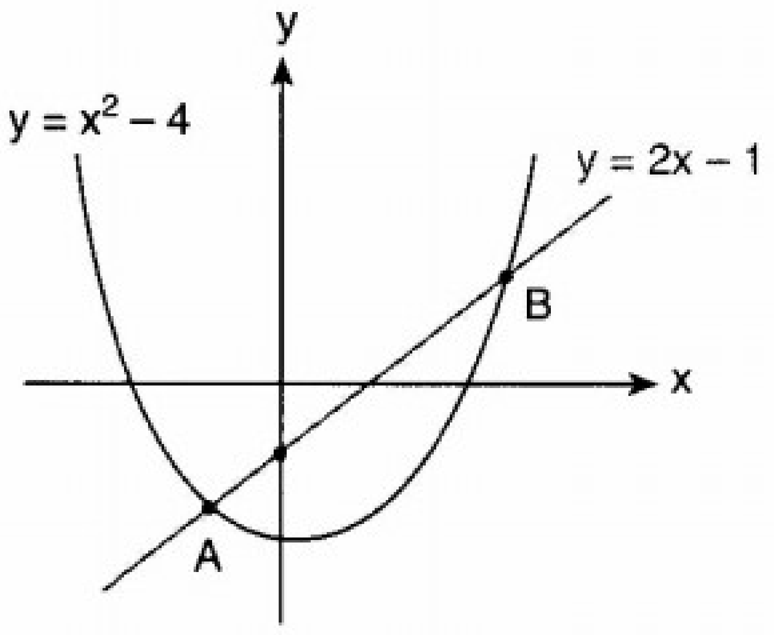
A) -1

B) 0

C) 1

D) 2

E) 3


y
y = x² – 4
y = 2x – 1
B
x
A

10. **$m + n = ?$**

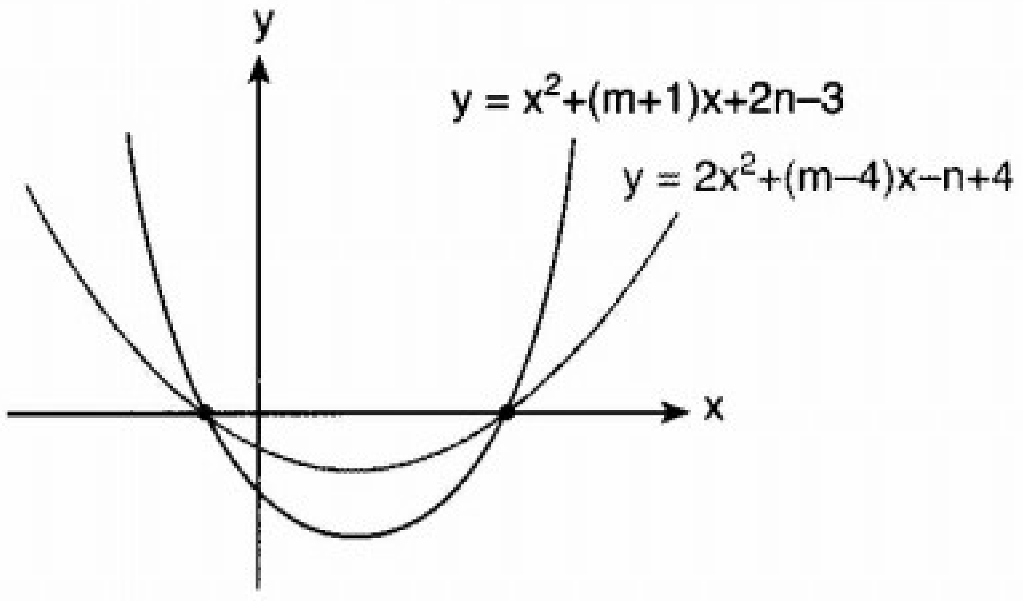
A) -7

B) -6

C) -5

D) -4

E) -3


y
y = x²+(m+1)x+2n–3
y = 2x²+(m–4)x–n+4
x

11. **$m = ?$**

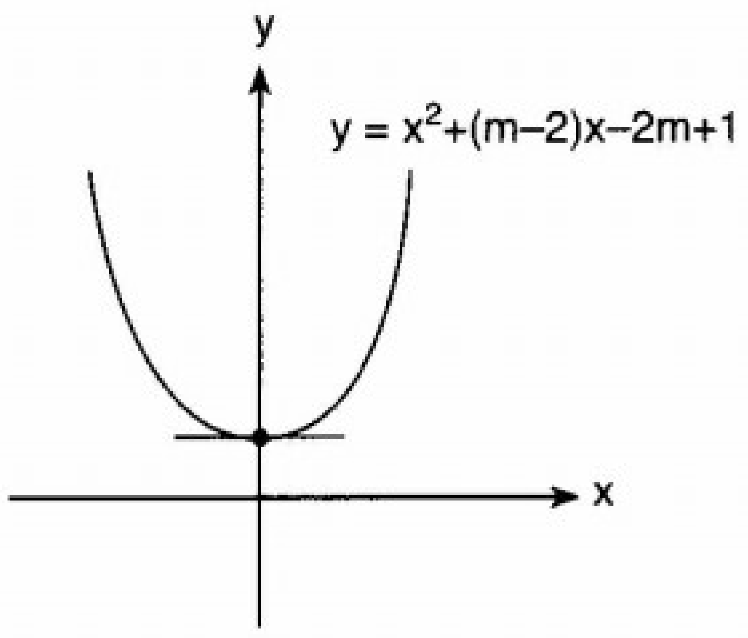
A) 2

B) 3

C) 4

D) 6

E) 8


y
y = x²+(m–2)x–2m+1
x

12. **$m = ?$**

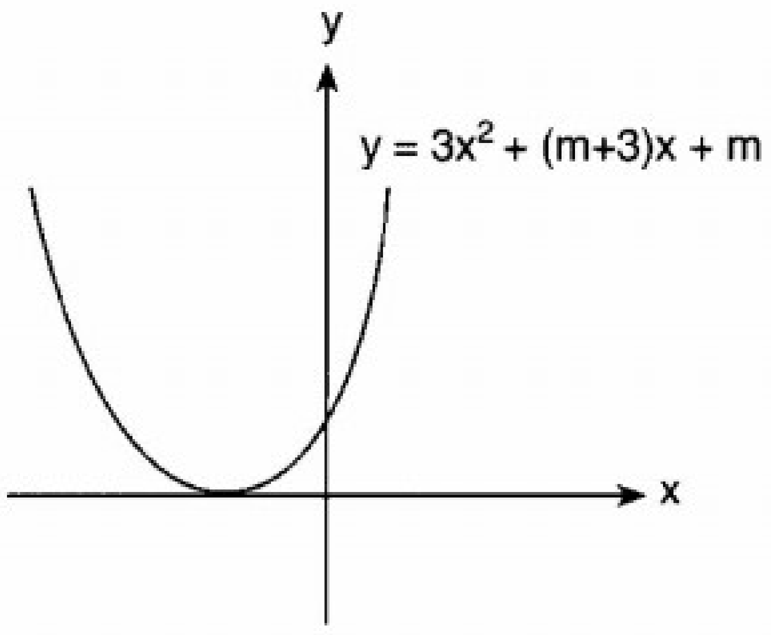
A) -3

B) -1

C) 1

D) 3

E) 5


y
y = 3x² + (m+3)x + m
x

YANITLAR / ANSWERS							
1. B	**2. C**	**3. C**	**4. D**	**5. A**	**6. E**	**7. B**	**8. B**
9. D	**10. D**	**11. A**	**12. D**				

ÜNİTE 7

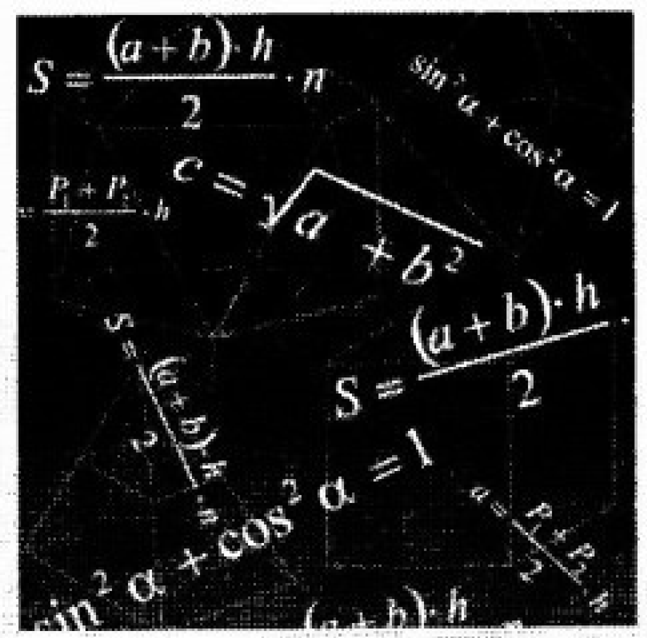
UNIT

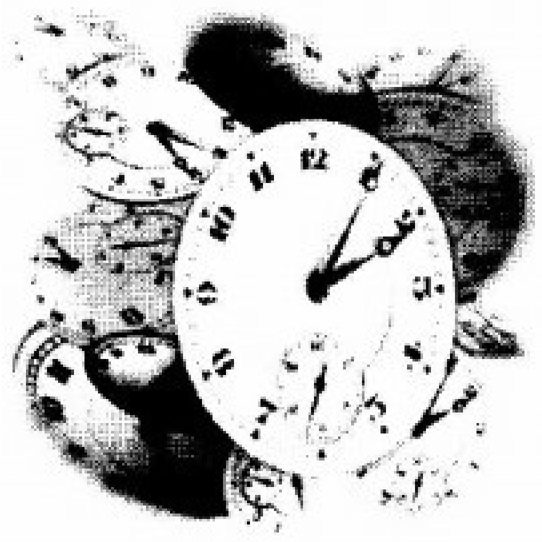
Bu ünitede, trigonometri, karmaşık sayılar ve logaritma ayrıntılı olarak anlatılmıştır. Trigonometri konusu zor olduğundan iki kısma ayrılmıştır. Birinci bölüm temel trigonometri kurallarından, ikinci bölüm ise trigonometrik formüllerden oluşmuştur.

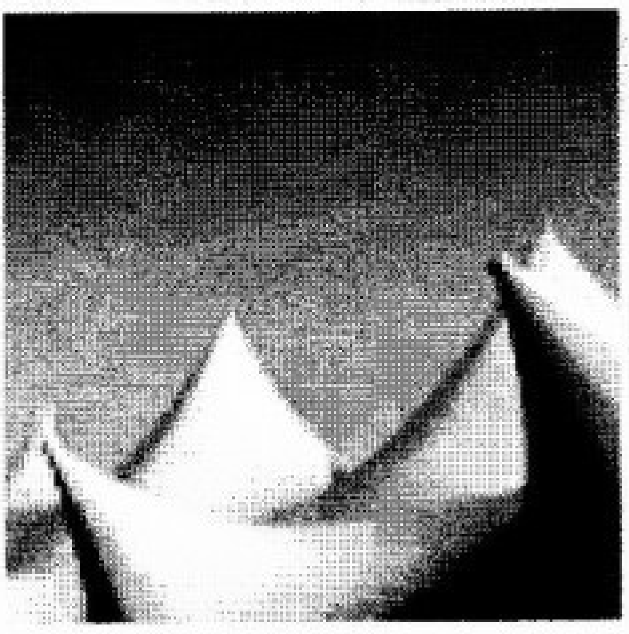
Bu ünite; 203 çözümlü örnek, 72 alıştırma ve 132 test sorusundan oluşmaktadır.

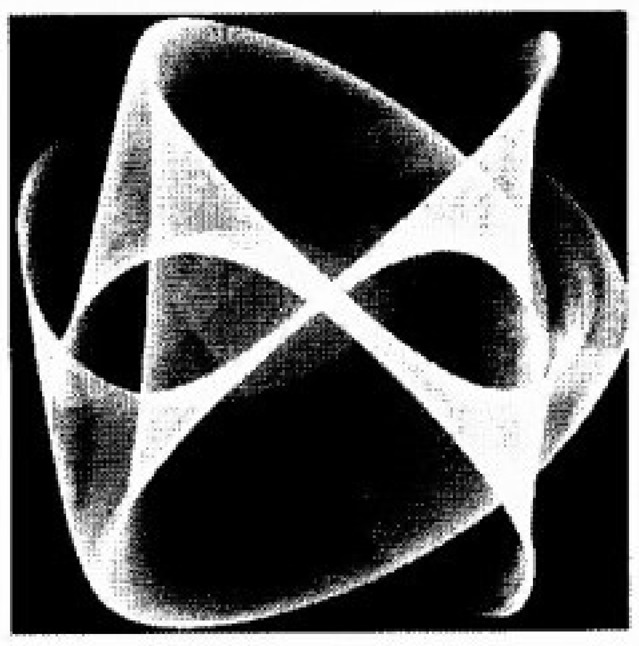
In this unit, trigonometry, complex numbers and logarithm are explained in detailed. Trigonometry is consist of two parts since this subject is very hardly. First chapter include basic rules of trigonometry and other chapter is consist of trigonometric formulas.

This unit includes; 132 test questions.


$S=\frac{(a+b)\cdot h}{2}\cdot n$
$\sin^2\alpha+\cos^2\alpha=1$
$c=\sqrt{a^2+b^2}$
$S=\frac{(a+b)\cdot h}{2}$
$\sin^2\alpha+\cos^2\alpha=1$







- ◆ **TRİGONOMETRİ I / *TRIGONOMETRY I*** .... 417 – 456
- ◆ **TRİGONOMETRİ II / *TRIGONOMETRY II*** .... 457 – 498
- ◆ **KARMAŞIK SAYILAR / *COMPLEX NUMBERS*** .... 499 – 526
- ◆ **LOGARİTMA / *LOGARITHM*** .... 527 – 554

1. $\frac{5\pi}{4}R = x° \Rightarrow \mathbf{x = ?}$

A) 135°
B) 175°
C) 180°
D) 210°
E) 225°

2. $\frac{4\pi}{3}R = x° \Rightarrow \mathbf{x = ?}$

A) 180°
B) 195°
C) 210°
D) 225°
E) 240°

3. $140° = x \cdot \pi \Rightarrow \mathbf{x = ?}$

A) $\frac{4\pi}{9}$
B) $\frac{5\pi}{9}$
C) $\frac{7\pi}{9}$
D) $\frac{10\pi}{9}$
E) $\frac{4\pi}{9}$

4. $252° = x\pi \Rightarrow \mathbf{x = ?}$

A) $\frac{7\pi}{5}$
B) $\frac{13\pi}{12}$
C) π
D) $\frac{11\pi}{12}$
E) $\frac{5\pi}{6}$

5. $2578° = x + k \cdot 360° \Rightarrow \mathbf{x = ?}$

A) 58°
B) 68°
C) 78°
D) 88°
E) 98°

6. $2146° = x + k \cdot 360° \Rightarrow \mathbf{x = ?}$

A) 314°
B) 330°
C) 346°
D) 352°
E) 356°

7. $-1472° = x + k \cdot 360° \Rightarrow$ **x = ?**

A) 318°

B) 328°

C) 338°

D) 348°

E) 358°

8. $-928° = x + k \cdot 360° \Rightarrow$ **x = ?**

A) 130°

B) 136°

C) 140°

D) 146°

E) 152°

9. $\frac{72\pi}{5} = x + 2k\pi \Rightarrow x = ?$

A) $\frac{\pi}{5}$

B) $\frac{2\pi}{5}$

C) $\frac{3\pi}{5}$

D) $\frac{4\pi}{5}$

E) π

10. $\frac{47\pi}{3} = x + 2k\pi \Rightarrow$ **x = ?**

A) $\frac{11\pi}{6}$

B) $\frac{5\pi}{3}$

C) $\frac{3\pi}{2}$

D) $\frac{4\pi}{3}$

E) $\frac{7\pi}{6}$

11. $\frac{-29\pi}{3} = x + 2k\pi \Rightarrow$ **x = ?**

A) $\frac{\pi}{3}$

B) $\frac{2\pi}{3}$

C) π

D) $\frac{4\pi}{3}$

E) $\frac{5\pi}{3}$

12. $\frac{-34\pi}{5} = x + 2k\pi \Rightarrow$ **x = ?**

A) $\frac{3\pi}{5}$

B) $\frac{4\pi}{5}$

C) π

D) $\frac{6\pi}{5}$

E) $\frac{7\pi}{5}$

YANITLAR / ANSWERS							
1. E	2. E	3. C	4. A	5. A	6. C	7. B	8. E
9. B	10. B	11. A	12. D				

1. $\dfrac{D}{180°}=\dfrac{R}{\pi} \Rightarrow \dfrac{x}{180°}=\dfrac{\frac{5\pi}{4}}{\pi}$

$$x=180°\cdot\frac{5}{4}$$

$$x=225°$$

Yanıt / The Answer is E

2. $\dfrac{D}{180°}=\dfrac{R}{\pi} \Rightarrow \dfrac{x}{180°}=\dfrac{\frac{4\pi}{3}}{\pi}$

$$x=180°\cdot\frac{4}{3}$$

$$x=240°$$

Yanıt / The Answer is E

3. $\dfrac{D}{180°}=\dfrac{R}{\pi} \Rightarrow \dfrac{140°}{180°}=\dfrac{x}{\pi}$

$$x=\frac{140°\pi}{180°}$$

$$x=\frac{7\pi}{9}$$

Yanıt / The Answer is C

4. $\dfrac{D}{180°}=\dfrac{R}{\pi} \Rightarrow \dfrac{252°}{180°}=\dfrac{x}{\pi}$

$$x=\frac{252°\cdot\pi}{180°}$$

$$x=\frac{7\pi}{5}$$

Yanıt / The Answer is A

5. $\begin{array}{r|l} 2578 & 360 \\ \cline{2-2} -\ 2520 & 7 \\ \hline 58 & \end{array} \Rightarrow 2578°=x+k\cdot360°$

$$2520°+58°=x+7\cdot360°$$

$$x=58°$$

Yanıt / The Answer is A

6. $\begin{array}{r|l} 2146 & 360 \\ \cline{2-2} -\ 1800 & 5 \\ \hline 346 & \end{array} \Rightarrow 2146°=x+k\cdot360°$

$$1800°+346°=x+5\cdot360°$$

$$x=346°$$

Yanıt / The Answer is C

7.

$$\begin{array}{r|l} -1472 & 360 \\ \underline{-\;-1800} & -5 \\ 328 & \end{array} \Rightarrow -1472 = x + k \cdot 360°$$

$$-1800 + 328° = x + (-5) \cdot 360°$$

$$x = 328°$$

Yanıt / The Answer is B

8.

$$\begin{array}{r|l} -928 & 360 \\ \underline{-\;-1080} & -3 \\ 152 & \end{array} \Rightarrow -928 = x + k \cdot 360°$$

$$-1080 + 252° = x + (-3) \cdot 360°$$

$$x = 152°$$

Yanıt / The Answer is E

9.

$$\frac{72\pi}{5} = x + 2k\pi$$

$$\frac{70\pi}{5} + \frac{2\pi}{5} = x + 2k\pi$$

$$x = \frac{2\pi}{5}$$

Yanıt / The Answer is B

10.

$$\frac{42\pi}{3} + \frac{5\pi}{3} = x + 2k\pi$$

$$x = \frac{5\pi}{3}$$

Yanıt / The Answer is B

11.

$$-\frac{29\pi}{3} = x + 2k\pi$$

$$-\frac{30\pi}{3} + \frac{\pi}{3} = x + 2k\pi$$

$$x = \frac{\pi}{3}$$

Yanıt / The Answer is A

12.

$$-\frac{34\pi}{5} = x + 2k\pi$$

$$-\frac{40\pi}{5} + \frac{6\pi}{5} = x + 2k\pi$$

$$x = \frac{6\pi}{5}$$

Yanıt / The Answer is D

1. $A = \dfrac{1+\cos x}{2} \Rightarrow\ ? < A < ?$

A) $-1 \le A \le 0$

B) $-1 \le A \le 1$

C) $0 \le A \le 1$

D) $0 < A \le 1$

E) $-1 < A < 1$

2. $\dfrac{1-\cot x}{1-\tan x} = ?$

A) tanx

B) cotx

C) 1

D) –cotx

E) –tanx

3. $\cos 15° = a \Rightarrow \dfrac{\sin^2 15°}{1-\cos 15°} = ?$

A) a

B) a – 1

C) a + 1

D) 2a – 1

E) –2a

4. $\tan a = \dfrac{1}{2}$,

$\dfrac{\cot a - \cot b}{\cot a \cdot \cot b} = 1 \Rightarrow \tan b = ?$

A) $\dfrac{1}{3}$

B) $\dfrac{1}{2}$

C) 1

D) $\dfrac{4}{3}$

E) $\dfrac{3}{2}$

5. $\cos^4 x - \sin^4 x = ?$

A) $1 - \cos^2 x$

B) $\cos^2 x - 1$

C) $1 - \sin^2 x$

D) $1 - 2\sin^2 x$

E) $1 - \sin^2 x$

6. $x \in \left(0, \dfrac{\pi}{2}\right)$

$\Rightarrow \sqrt{1-\sin x} \cdot \sqrt{1+\sin x} = ?$

A) cosx

B) 1

C) sinx

D) cosx + 1

E) sinx + 1

7. $\dfrac{\sin^2x}{1+\cos x}+\cos x = ?$

A) 1 + 2cosx

B) 2sinx

C) 2cosx

D) 1

E) –1

8. $\dfrac{1-\sin^2x}{\cos^2x}+\tan x\cdot\cot x = ?$

A) 0

B) 1

C) sinx

D) cosx

E) 2

9. $\dfrac{1}{\cos^2x}-\dfrac{1}{\cot^2x} = ?$

A) tanx

B) cotx

C) sinx

D) cosx

E) 1

10. $\dfrac{1+\cos x}{\sin x}+\dfrac{\sin x}{1+\cos x} = ?$

A) secx

B) cosecx

C) sinx

D) cosx

E) 2cosecx

11. $\left(\dfrac{\cos x}{1-\sin^2x}-\dfrac{\sin x}{1-\cos^2x}\right):\left(\dfrac{\sin x-\cos x}{\sin x}\right) = ?$

A) secx

B) cosecx

C) –secx

D) –cosecx

E) cosx

12. $\cot x+\dfrac{\sin x}{1+\cos x} = ?$

A) sinx

B) cosx

C) tanx

D) cosecx

E) secx

YANITLAR / ANSWERS

1. C	2. D	3. C	4. E	5. D	6. A	7. D	8. E
9. E	10. E	11. A	12. D				

1. $A = \dfrac{1+\cos x}{2}$

$2A = 1+\cos x$

$2A-1 = \cos x$

$-1 \le \cos x \le 1 \Rightarrow -1 \le 2A-1 \le 1$

$0 \le A \le 1$

Yanıt / The Answer is C

---

2. $\dfrac{1-\cot x}{1-\tan x} = \dfrac{1-\dfrac{\cos x}{\sin x}}{1-\dfrac{\sin x}{\cos x}}$

$= \dfrac{\dfrac{\sin x-\cos x}{\sin x}}{\dfrac{\cos x-\sin x}{\cos x}}$

$= -\cot x$

Yanıt / The Answer is D

---

3. $\sin^2 15° = 1-\cos^2 15°$

$\dfrac{\sin^2 15°}{1-\cos^2 15°} = \dfrac{1-\cos^2 15°}{1-\cos 15°}$

$= \dfrac{(1-\cos 15°)\cdot(1+\cos 15°)}{1-\cos 15°}$

$= 1+\cos 15°$

$= 1+a$

Yanıt / The Answer is C

---

4. $\tan a = \dfrac{1}{2} \Rightarrow \cot a = 2$

$\dfrac{\cot a-\cot b}{\cot a\cdot\cot b} = 1$

$\dfrac{2-\cot b}{2\cdot\cot b} = 1$

$2 = 3\cdot\cot b$

$\cot b = \dfrac{2}{3} \Rightarrow \tan b = \dfrac{3}{2}$

Yanıt / The Answer is E

---

5. $\cos^4 x-\sin^4 x = (\cos^2 x-\sin^2 x)\cdot(\cos^2 x+\sin^2 x)$

$= (\cos^2 x-\sin^2 x)\cdot 1$

$= 1-\sin^2 x-\sin^2 x$

$= 1-2\sin^2 x$

Yanıt / The Answer is D

---

6. $\sqrt{1-\sin x}\cdot\sqrt{1+\sin x} = \sqrt{1-\sin^2 x}$

$= \sqrt{\cos^2 x}$

$= |\cos x|$

$x \in \left(0, \dfrac{\pi}{2}\right) \Rightarrow |\cos x| = \cos x$

Yanıt / The Answer is A

7. $$\frac{\sin^2 x}{1+\cos x}+\cos x=\frac{1-\cos^2 x}{1+\cos x}+\cos x$$
$$=1-\cos x+\cos x$$
$$=1$$

Yanıt / The Answer is D

8. $$\frac{1-\sin^2 x}{\cos^2 x}+\tan x\cdot\cot x=\frac{\cos^2 x}{\cos^2 x}+1$$
$$=1+1=2$$

Yanıt / The Answer is E

9. $$\frac{1}{\cos^2 x}-\frac{1}{\cot^2 x}=\frac{1}{\cos^2 x}-\frac{1}{\dfrac{\cos^2 x}{\sin^2 x}}$$
$$=\frac{1}{\cos^2 x}-\frac{\sin^2 x}{\cos^2 x}$$
$$=\frac{1-\sin^2 x}{\cos^2 x}$$
$$=\frac{\cos^2 x}{\cos^2 x}=1$$

Yanıt / The Answer is E

10. $$\underset{(1+\cos x)}{\frac{1+\cos x}{\sin x}}+\underset{(\sin x)}{\frac{\sin x}{1+\cos x}}=\frac{(1+\cos x)^2+\sin^2 x}{(1+\cos x)\cdot\sin x}$$
$$=\frac{1+2\cos x+\cos^2 x+\sin^2 x}{(1+\cos x)\cdot\sin x}$$
$$=\frac{2+2\cos x}{(1+\cos x)\cdot\sin x}$$
$$=\frac{2}{\sin x}$$
$$=2\operatorname{cosec}x$$

Yanıt / The Answer is E

11. $$\left(\frac{\cos x}{1-\sin^2 x}-\frac{\sin x}{1-\cos^2 x}\right):\left(\frac{\sin x-\cos x}{\sin x}\right)$$
$$=\left(\frac{\cos x}{\cos^2 x}-\frac{\sin x}{\sin^2 x}\right):\left(\frac{\sin x-\cos x}{\sin x}\right)$$
$$=\left(\frac{1}{\cos x}-\frac{1}{\sin x}\right)\cdot\left(\frac{\sin x}{\sin x-\cos x}\right)$$
$$=\frac{\sin x-\cos x}{\sin x\cdot\cos x}\cdot\frac{\sin x}{\sin x-\cos x}$$
$$=\frac{1}{\cos x}=\sec x$$

Yanıt / The Answer is A

12. $$\cot x+\frac{\sin x}{1+\cos x}=\frac{\cos x}{\sin x}+\frac{\sin x}{1+\cos x}$$
$$=\frac{\cos(1+\cos x)+\sin^2 x}{\sin x\cdot(1+\cos x)}$$
$$=\frac{\cos x+\cos^2 x+\sin^2 x}{\sin x\cdot(1+\cos x)}$$
$$=\frac{1+\cos x}{\sin x\cdot(1+\cos x)}$$
$$=\frac{1}{\sin x}=\operatorname{cosec}x$$

Yanıt / The Answer is D

1. $0 < x < \frac{\pi}{2}$, $\sin x = 0{,}6 \Rightarrow \tan x = ?$

A) $\frac{5}{3}$

B) $\frac{4}{3}$

C) $\frac{3}{4}$

D) $\frac{3}{5}$

E) $\frac{1}{2}$

2. $\cos \frac{11\pi}{3} = ?$

A) $\frac{1}{2}$

B) $\frac{3}{5}$

C) $\frac{3}{4}$

D) $\frac{4}{5}$

E) $\frac{9}{10}$

3. $\tan 210° = ?$

A) $\sqrt{2}$

B) $\sqrt{3}$

C) $\frac{1}{\sqrt{2}}$

D) $\frac{\sqrt{3}}{3}$

E) $\frac{1}{2}$

4. $\frac{\sin 300°}{1 - \cos 240°} = ?$

A) $-\sqrt{3}$

B) $-\frac{\sqrt{3}}{2}$

C) $-\frac{\sqrt{3}}{3}$

D) $-\frac{\sqrt{2}}{2}$

E) -1

5. $\frac{\pi}{2} < x < \pi$, $\tan x = -\frac{4}{3} \Rightarrow \cos x = ?$

A) $-\frac{3}{5}$

B) $-\frac{4}{5}$

C) $\frac{3}{5}$

D) $\frac{4}{5}$

E) $\frac{2}{5}$

6. $(\sin x - \cos x)^2 + (\sin x + \cos x)^2 = ?$

A) -3

B) -2

C) 0

D) 2

E) 3

7. $\dfrac{\cos 37°}{\sin 127°} = ?$

A) $-\cos 37°$

B) -1

C) 1

D) $\cos 37°$

E) $\tan 37°$

8. $0 < x < 2\pi$

$2\sin^2 x - 5 \cdot \sin x + 2 = 0 \Rightarrow$ **ÇK(SS) = ?**

A) {60° , 150°}

B) {45° , 135°}

C) {60° , 120°}

D) {30° , 150°}

E) {30° , 120°}

9. $3\sin x - 4\cos y = A \Rightarrow$ **max(A) = ?**

A) -1

B) 0

C) 2

D) 3

E) 7

10. $\dfrac{\sin 30° + \cos 30°}{\tan 45° + \cot 30°} = ?$

A) 1

B) $\dfrac{1}{2}$

C) $\dfrac{\sqrt{3}}{2}$

D) $\dfrac{\sqrt{2}}{2}$

E) $\dfrac{1+\sqrt{3}}{2}$

11. $\dfrac{\cos 150° - \sin 150°}{\cos(-330°) - \sin(-750°)} = ?$

A) $-\dfrac{\sqrt{3}}{3}$

B) -1

C) $\dfrac{\sqrt{3}}{3}$

D) 1

E) 3

12. $\dfrac{\pi}{2} < x < \pi$

$\sin x = \dfrac{3}{5} \Rightarrow$ **$\tan x - \cos x = ?$**

A) $-\dfrac{1}{10}$ B) $-\dfrac{1}{20}$ C) 0

D) $\dfrac{1}{10}$ E) $\dfrac{1}{20}$

YANITLAR / ANSWERS

1. C	2. A	3. D	4. C	5. A	6. D	7. C	8. D
9. E	10. B	11. B	12. E				

1. $\sin x = 0{,}6$

$= \frac{6}{10}$

$= \frac{3}{5}$

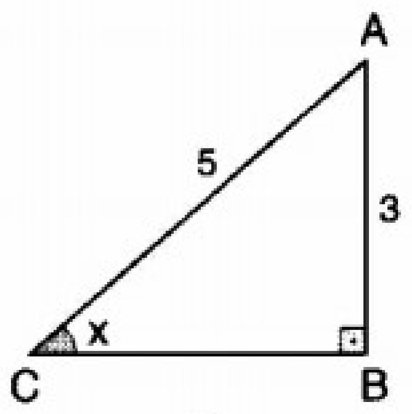
$\sin x = \frac{|AB|}{|AC|}$

$|AC|^2 = |AB|^2 + |BC|^2$

$5^2 = 3^2 + |BC|^2$

$|BC| = 4$

$\Rightarrow \tan x = \frac{|AB|}{|BC|} = \frac{3}{4}$



Yanıt / The Answer is C

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2. $\frac{11\pi}{3} = x + 2k\pi$

$\frac{6\pi}{3} + \frac{5\pi}{3} = x + 2k\pi \Rightarrow x = \frac{5\pi}{3}$

$\cos\frac{11\pi}{3} = \cos\frac{5\pi}{3}$

$= \cos\left(2\pi - \frac{\pi}{3}\right)$

$= \cos\frac{\pi}{3} = \frac{1}{2}$

Yanıt / The Answer is A

---

3. $\tan 210° = \tan(180° + 30°)$

$= \tan 30°$

$= \frac{\sqrt{3}}{3}$

Yanıt / The Answer is D

---

4. $\frac{\sin 300°}{1-\cos 240°} = \frac{\sin(360°-60°)}{1-\cos(180°+60°)}$

$= \frac{-\sin 60°}{1-(-\cos 60°)}$

$= \frac{-\frac{\sqrt{3}}{2}}{1+\frac{1}{2}}$

$= -\frac{\sqrt{3}}{3}$

Yanıt / The Answer is C

---

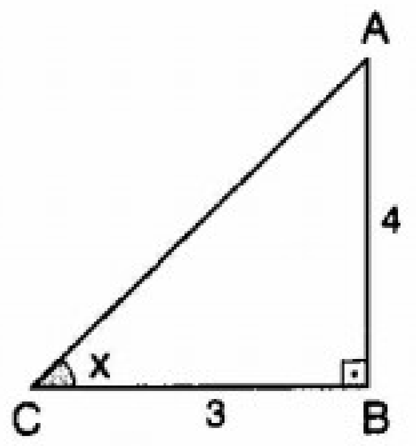
5. $\tan x = -\frac{4}{3}$

$|AC|^2 = |AB|^2 + |BC|^2$

$|AC|^2 = 4^2 + 3^2$

$|AC| = 5$

$\cos x = -\frac{3}{5}$



Yanıt / The Answer is A

---

6. $(\sin x - \cos x)^2 + (\sin x + \cos x)^2$

$= \sin^2 x + \cos^2 x - 2\sin x \cdot \cos x + \sin^2 x + \cos^2 x + 2\sin x \cdot \cos x$

$= 1 - 2\sin x \cdot \cos x + 1 + 2\sin x \cdot \cos x$

$= 2$

Yanıt / The Answer is D

7. $$\frac{\cos 37^\circ}{\sin 127^\circ}=\frac{\cos 37^\circ}{\cos(90^\circ+37^\circ)}$$

$$=\frac{\cos 37^\circ}{\cos 37^\circ}$$

$$=1$$

Yanıt / The Answer is C

8. $2\sin^2 x-5\cdot\sin x+2=0$

$(2\sin x-1)\cdot(\sin x-2)=0$

$2\sin x-1=0$ veya (or) $\sin x-2=0$

$\sin x=\frac{1}{2}$ $\qquad$ $\sin x=2 \Rightarrow$ ÇK(SS) $=\varnothing$

$x=30^\circ,\quad x=150^\circ$

ÇK(SS) $=\{30^\circ,150^\circ\}$

Yanıt / The Answer is D

9. $-1\le \sin x\le 1 \;\Rightarrow\; -3\le 3\sin x\le 3$

$-1\le \cos y\le 1 \;\Rightarrow\; \underline{-4\le -4\cos y\le 4}$

$-7\le 3\sin x-4\cos y\le 7$

$-7\le A\le 7 \;\Rightarrow\; \max(A)=7$

Yanıt / The Answer is E

10. $$\frac{\sin 30^\circ+\cos 30^\circ}{\tan 45^\circ+\cot 30^\circ}=\frac{\frac{1}{2}+\frac{\sqrt{3}}{2}}{1+\sqrt{3}}$$

$$=\frac{\frac{1+\sqrt{3}}{2}}{1+\sqrt{3}}$$

$$=\frac{1}{2}$$

Yanıt / The Answer is B

11. $$\frac{\cos 150^\circ-\sin 150^\circ}{\cos(-330^\circ)-\sin(-750^\circ)}$$

$$=\frac{\cos(180^\circ-30^\circ)-\sin(180^\circ-30^\circ)}{\cos(360^\circ-30^\circ)+\sin 30^\circ}$$

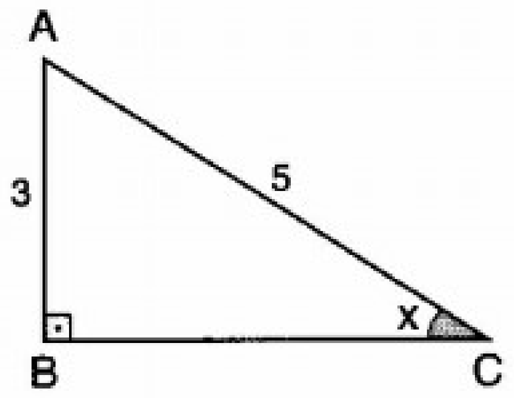
$$=\frac{-\cos 30^\circ-\sin 30^\circ}{\cos 30^\circ+\sin 30^\circ}$$

$$=-1$$

Yanıt / The Answer is B

12. $\frac{\pi}{2}<x<\pi$

$\sin x=\frac{3}{5} \Rightarrow$



$|AC|^2=|AB|^2+|BC|^2$

$25=9+|BC|^2 \Rightarrow |BC|=4$

$\frac{\pi}{2}<x<\pi \Rightarrow \tan x=-\frac{3}{4},\quad \cos x=-\frac{4}{5}$

$$\tan x-\cos x=-\frac{3}{4}-\left(-\frac{4}{5}\right)$$

$$=-\frac{3}{4}+\frac{4}{5}=\frac{1}{20}$$

Yanıt / The Answer is E

1. $120° = k \cdot \pi \Rightarrow k = ?$

Yanıt / The Answer is: $\frac{2\pi}{3}$

2. $\left.\begin{array}{l} \alpha = \frac{3\pi}{4} \\ \alpha = x° \end{array}\right\} \Rightarrow x = ?$

Yanıt / The Answer is: **135°**

3. $\frac{1-\cos^2 x}{\sec^2 x - 1} = ?$

Yanıt / The Answer is: **$\cos^2 x$**

4. $\frac{1}{1+\tan^2 x} + \frac{1}{1+\cot^2 x} = ?$

Yanıt / The Answer is: **1**

5. $\frac{\cos 300° + \sin 120°}{\tan 45° + \tan 60°} = ?$

Yanıt / The Answer is: $\frac{1}{2}$

6. $\frac{\cos 210° - \sin 420°}{\sin(-240°) + \cos(-30°)} = ?$

Yanıt / The Answer is: **–1**

7. $\frac{3\pi}{2} < \alpha < 2\pi$

$\sin\alpha = -\frac{5}{13} \Rightarrow \mathbf{\cos\alpha = ?}$

Yanıt / The Answer is: $\mathbf{\frac{12}{13}}$

8. $\mathbf{\cos(180° - x) = ?}$

Yanıt / The Answer is: $\mathbf{-\cos x}$

9. $\frac{\mathbf{\sin x}}{\mathbf{\operatorname{cosec} x}} + \frac{\mathbf{\cos x}}{\mathbf{\sec x}} = \mathbf{?}$

Yanıt / The Answer is: **1**

10. $1356° = x + k \cdot 360° \Rightarrow \mathbf{x = ?}$

Yanıt / The Answer is: **276°**

11. $-935° = x + k \cdot 360° \Rightarrow \mathbf{x = ?}$

Yanıt / The Answer is: **145°**

12. $\frac{45\pi}{4} = x + k \cdot 2\pi \Rightarrow \mathbf{x = ?}$

Yanıt / The Answer is: $\mathbf{\frac{5\pi}{4}}$

13. $\frac{-78\pi}{7} = x + k \cdot 2\pi \quad \Rightarrow \quad \mathbf{x = ?}$

Yanıt / The Answer is: $\mathbf{\frac{6\pi}{7}}$

14. $\left.\begin{aligned} a &= \sin 50^\circ \\ b &= \cos 130^\circ \\ c &= \tan 200^\circ \\ d &= \cot 300^\circ \end{aligned}\right\} \Rightarrow \mathbf{a, b, c, d = ?, ?, ?, ?}$

Yanıt / The Answer is: **+ , – , + , –**

15. $\left.\begin{aligned} a &= \cos 20^\circ \\ b &= \cos 95^\circ \\ c &= \cos 155^\circ \end{aligned}\right\} \Rightarrow \mathbf{? < ? < ?}$

Yanıt / The Answer is: **c < b < a**

16. $\dfrac{\cos(\pi - x) + \sin\left(\frac{\pi}{2} - x\right)}{\tan\left(\frac{3\pi}{2} - x\right)} = ?$

Yanıt / The Answer is: **0**

17. $m \in \mathbb{Z}$,

$m = 5 - 2\sin^2\alpha \Rightarrow \sum m = ?$

Yanıt / The Answer is: **12**

18. $\mathbf{\cos 420^\circ + \sin(-300^\circ) + \tan 765^\circ = ?}$

Yanıt / The Answer is: $\mathbf{\frac{3+\sqrt{3}}{2}}$

19. $\dfrac{\cos^2 x}{1+\sin x} + \sin x = ?$

Yanıt / The Answer is: **1**

20. $\tan x + \cot x = 4 \Rightarrow \tan^2 x + \cot^2 x = ?$

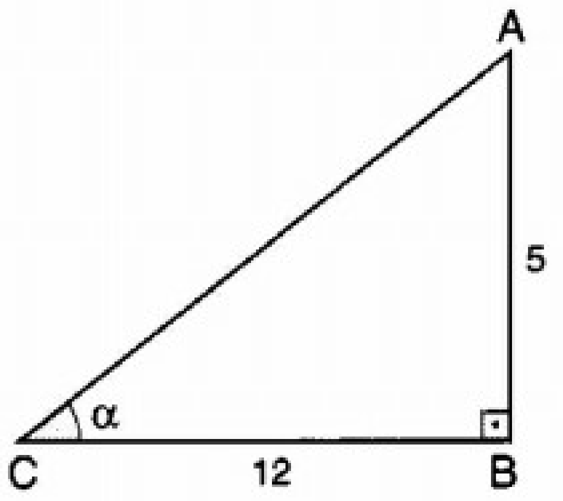
Yanıt / The Answer is: **14**

21. $0 < x < \dfrac{\pi}{2}$

$$\frac{3\sin x - \cos x}{2\sin x + 5\cos x} = \frac{3}{4} \Rightarrow \tan x = ?$$

Yanıt / The Answer is: $\dfrac{19}{6}$

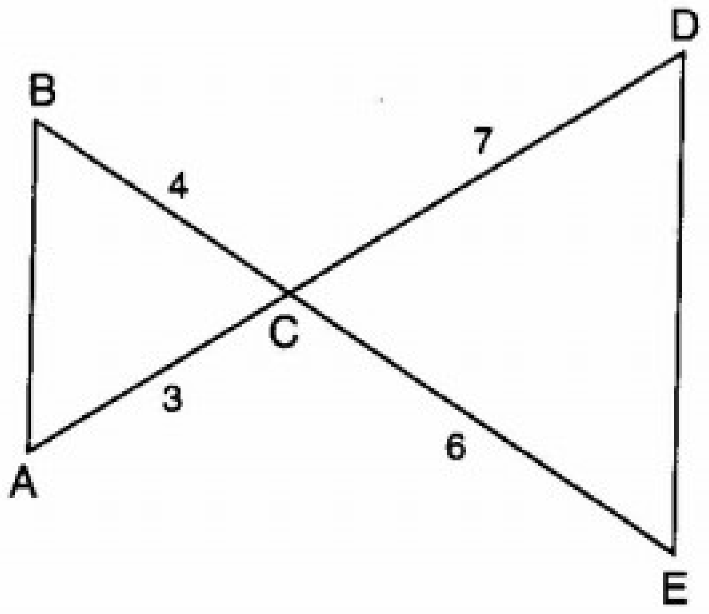
22.



$-\sin\alpha - \cos(180° - \alpha) + \tan(90° + \alpha) = ?$

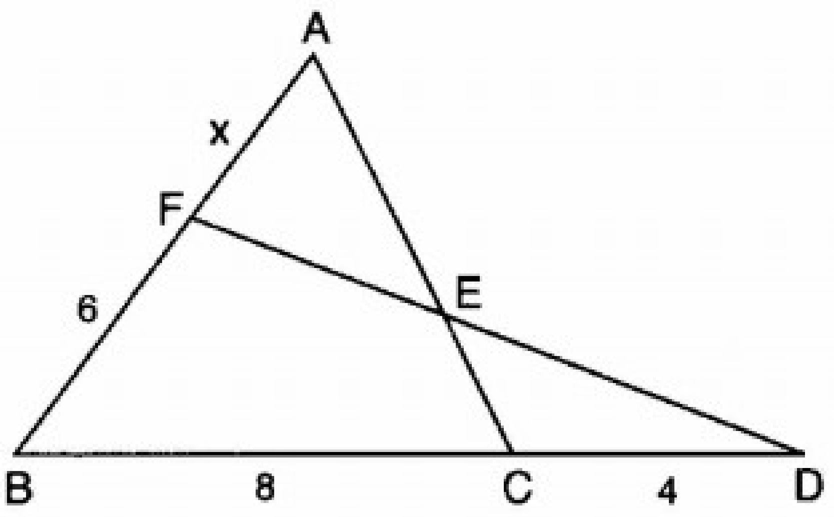
Yanıt / The Answer is: $-\dfrac{121}{65}$

23. $|BC| = 4$ cm,
$|AC| = 3$ cm,
$|CD| = 7$ cm,
$|CE| = 6$ cm,
$A(\overset{\Delta}{ABC}) = 4$ cm^2.
$A(\overset{\Delta}{CDE}) = ?$ cm^2



Yanıt / The Answer is: **14**

24. $|FB| = 6$ cm,
$|BC| = 8$ cm,
$|CD| = 4$ cm,
$A(\overset{\Delta}{AFE}) = A(\overset{\Delta}{ECD})$.
$|AF| = x = ?$ cm



Yanıt / The Answer is: **3**

1. $50° = xR \Rightarrow \mathbf{x = ?}$

A) $\frac{5\pi}{18}$

B) $\frac{2\pi}{9}$

C) $\frac{\pi}{6}$

D) $\frac{\pi}{9}$

E) $\frac{\pi}{18}$

2. $\frac{3\pi}{5} \cdot R = x° \Rightarrow \mathbf{x = ?}$

A) 84

B) 96

C) 108

D) 120

E) 132

3. $1280° = x + 360° \cdot k \Rightarrow \mathbf{x = ?}$

A) 160°

B) 170°

C) 180°

D) 190°

E) 200°

4. $-1370° = x + 360° \cdot k \Rightarrow \mathbf{x = ?}$

A) 25°

B) 40°

C) 60°

D) 70°

E) 95°

5. $\frac{47\pi}{3} = x + 2k\pi \Rightarrow \mathbf{x = ?}$

A) $\frac{\pi}{3}$

B) $\frac{2\pi}{3}$

C) π

D) $\frac{4\pi}{3}$

E) $\frac{5\pi}{3}$

6. $-\frac{51\pi}{4} = x + 2k\pi \Rightarrow \mathbf{x = ?}$

A) $\frac{\pi}{4}$

B) $\frac{\pi}{2}$

C) $\frac{3\pi}{4}$

D) π

E) $\frac{5\pi}{4}$

7. $\left.\begin{array}{l} a=\sin 100° \\ b=\sin 125° \\ c=\sin 145° \end{array}\right\} \Rightarrow \; ? < ? < ?$

A) $a < b < c$

B) $b < c < a$

C) $a < c < b$

D) $c < b < a$

E) $b < a < c$

8. $\sqrt{\cos^2 x} - \sqrt{1-\sin^2 x} = ?$

A) 0

B) 1

C) 2

D) 3

E) 4

9. $\dfrac{\sin x}{\tan x} + \dfrac{\sin^2 x}{1+\cos x} = ?$

A) –1

B) 0

C) 1

D) sinx

E) tanx

10. $\dfrac{\sin^2 x - \cos^2 x}{\sin x + \cos x} = \dfrac{1}{2} \Rightarrow \sin x \cdot \cos x = ?$

A) 1

B) $\dfrac{1}{4}$

C) $\dfrac{2}{7}$

D) $\dfrac{3}{8}$

E) $\dfrac{1}{2}$

11. $\dfrac{\sin^3 x + \sin x \cdot \cos^2 x}{\cos x} = ?$

A) 1

B) sinx

C) cosx

D) tanx

E) cotx

12. $(1+\sin x) \cdot \left(1 - \dfrac{1}{\sin x}\right) \cdot \tan x = ?$

A) cosx

B) –cosx

C) sinx

D) –cotx

E) tanx

YANITLAR / ANSWERS							
1. A	2. C	3. E	4. D	5. E	6. E	7. D	8. A
9. C	10. D	11. D	12. B				

7. $\cos 240° = ?$

A) $\frac{1}{2}$ B) $\frac{\sqrt{3}}{2}$ C) $-\frac{1}{2}$

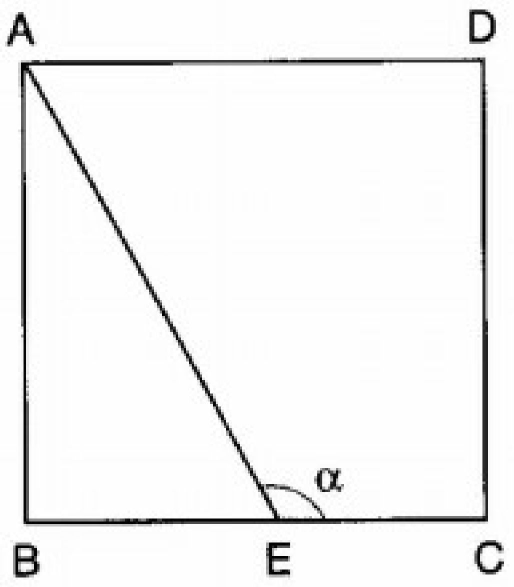
D) $-\frac{\sqrt{3}}{2}$ E) -1

8. $$\frac{\sin\left(\frac{3\pi}{2}+x\right)-\cos(\pi+x)}{\cos\left(\frac{3\pi}{2}-x\right)+\sin(-x)}=?$$

A) –tanx B) 0 C) 1

D) cotx E) tanx

9. ABCD bir karedir.
ABCD is a square.
$3|BE| = 4|EC|$
$\Rightarrow$ **cotα = ?**



A) $\frac{3}{7}$ B) $\frac{4}{7}$ C) $-\frac{3}{7}$

D) $-\frac{4}{7}$ E) $-\frac{5}{7}$

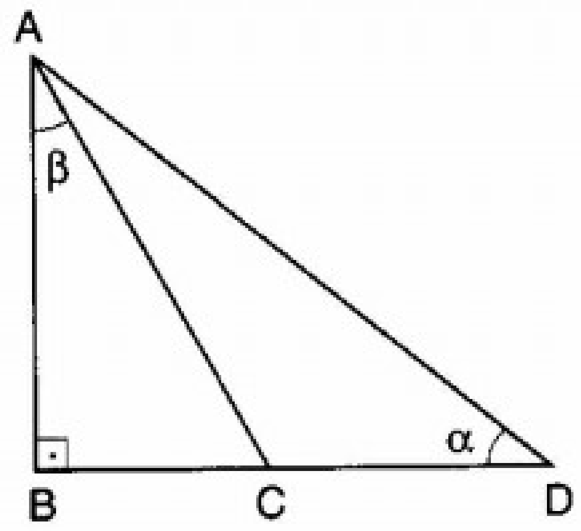
10. $0 < x < \frac{\pi}{2}$, $\tan x = \frac{5}{12}$

$\Rightarrow \cos(\pi - x) + \cos\left(\frac{\pi}{2} + x\right) = ?$

A) $-\frac{7}{13}$ B) $-\frac{12}{13}$ C) -1

D) $-\frac{15}{13}$ E) $-\frac{17}{13}$

11. $\tan\alpha = \frac{2}{5}$,
$\cot\beta = 2$,
$|CD| = 8$,
$|BC| = ?$



A) 1 B) 2 C) 3

D) 4 E) 5

12. $0 < x < \pi$,
$\sin^2 x + \sin x - 2 = 0 \Rightarrow$ **x = ?**

A) $\frac{\pi}{2}$ B) π C) $\frac{3\pi}{2}$

D) $\frac{5\pi}{2}$ E) 2π

YANITLAR / ANSWERS							
1. E	2. E	3. A	4. A	5. D	6. D	7. C	8. B
9. D	10. E	11. B	12. A				

1. $\sin 50° = m$

$\Rightarrow \cot 680° + \tan 230° - 2 \cdot \sin(-50°) = ?$

A) m

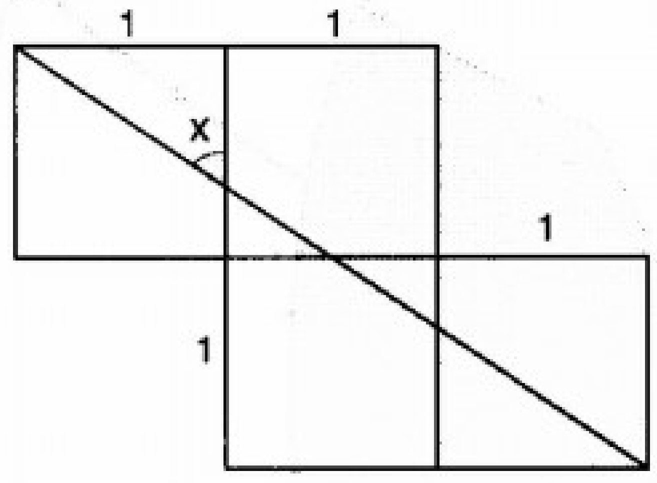
B) 2m

C) 3m

D) 4m

E) 9m

2. **sinx·cotx = ?**



A) $\frac{2\sqrt{13}}{13}$

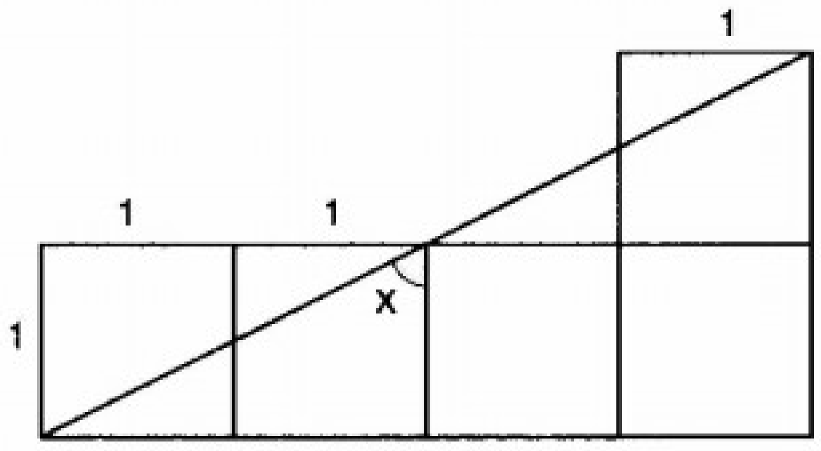
B) $\frac{\sqrt{13}}{2}$

C) $\frac{\sqrt{5}}{3}$

D) $\frac{\sqrt{2}}{5}$

E) $\frac{1}{2}$

3. **tanx = ?**



A) 2

B) $\frac{3}{2}$

C) 1

D) $\frac{1}{2}$

E) $\frac{1}{3}$

4.

$$\left.\begin{aligned} a &= \sin 70° \\ b &= \cos 40° \\ c &= \sin 125° \\ d &= \cos(-70°) \end{aligned}\right\} \Rightarrow ? < ? < ? < ?$$

A) a < b < c < d

B) d < b < c < a

C) d < c < b < a

D) c < d < b < a

E) c < d < a < b

5.

$$\left.\begin{aligned} a &= \tan 62° \\ b &= \sin 110° \\ c &= \cos 15° \\ d &= \cot 30° \end{aligned}\right\} \Rightarrow ? < ? < ? < ?$$

A) b < c < d < a

B) b < c < a < d

C) d < a < c < b

D) b < a < c < d

E) d < b < c < a

6. ABCD bir dikdörtgendir.

ABCD is a rectangle.

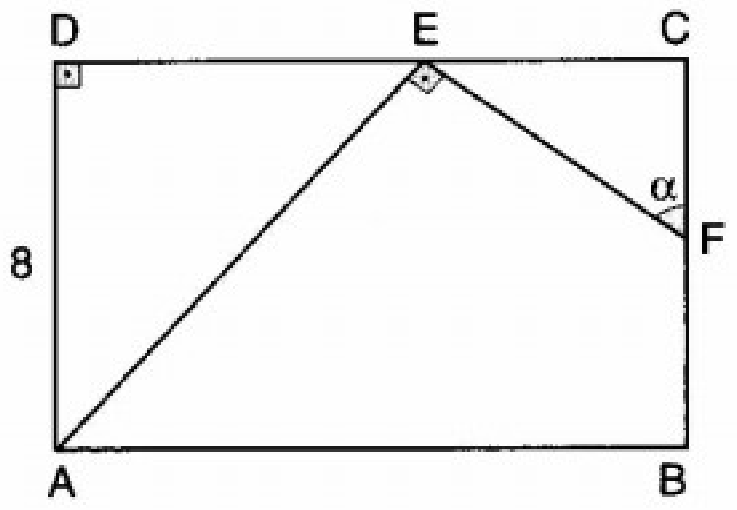
$m(\widehat{EFC}) = \alpha$,

$m(\widehat{AEF}) = 90°$,

$|AD| = 8$ cm,

$|DE| = 15$ cm.

sinα = ?



A) $\frac{8}{17}$

B) $\frac{15}{17}$

C) $\frac{5}{13}$

D) $\frac{3}{5}$

E) $\frac{4}{5}$

7. **x = ?**

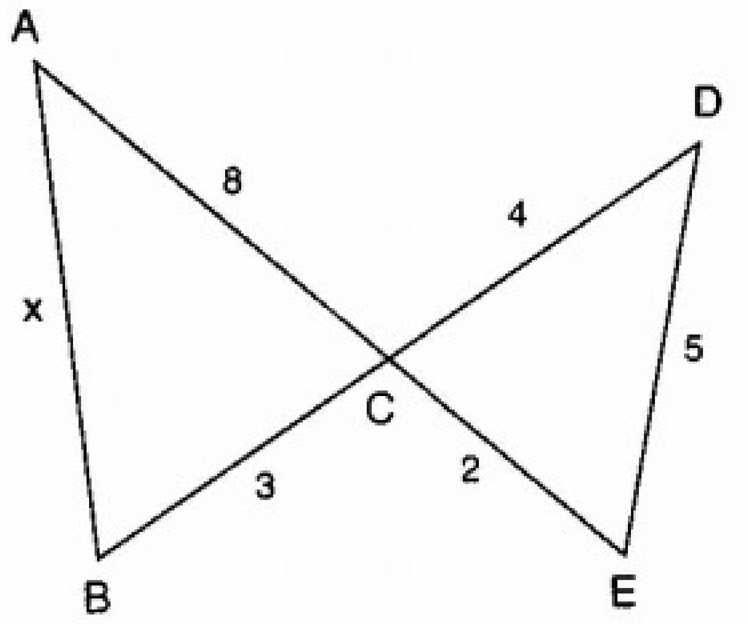
A) $\sqrt{22}$

B) $2\sqrt{22}$

C) $2\sqrt{26}$

D) $2\sqrt{29}$

E) $2\sqrt{34}$


A
D
8
4
x
5
C
3
2
B
E

8. **x = ?**

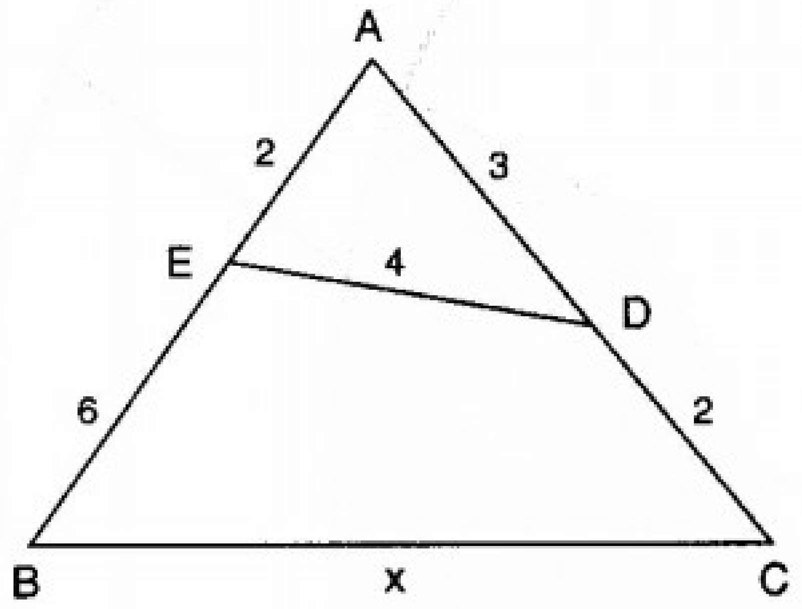
A) $\sqrt{103}$

B) $\sqrt{105}$

C) $\sqrt{107}$

D) $\sqrt{109}$

E) $\sqrt{113}$


A
2
3
E
4
D
6
2
B
x
C

9. $A(\overset{\Delta}{AFE}) = A(\overset{\Delta}{ECD})$

$\Rightarrow$ **x = ?**

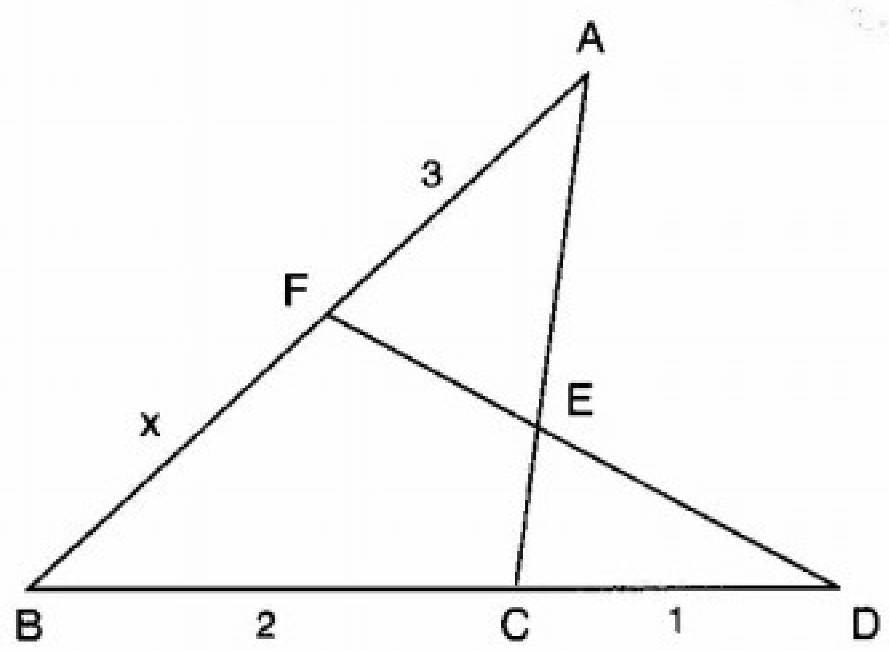
A) 3

B) 4

C) 5

D) 6

E) 8


A
3
F
x
E
B
2
C
1
D

10. **$\sin\theta$ = ?**

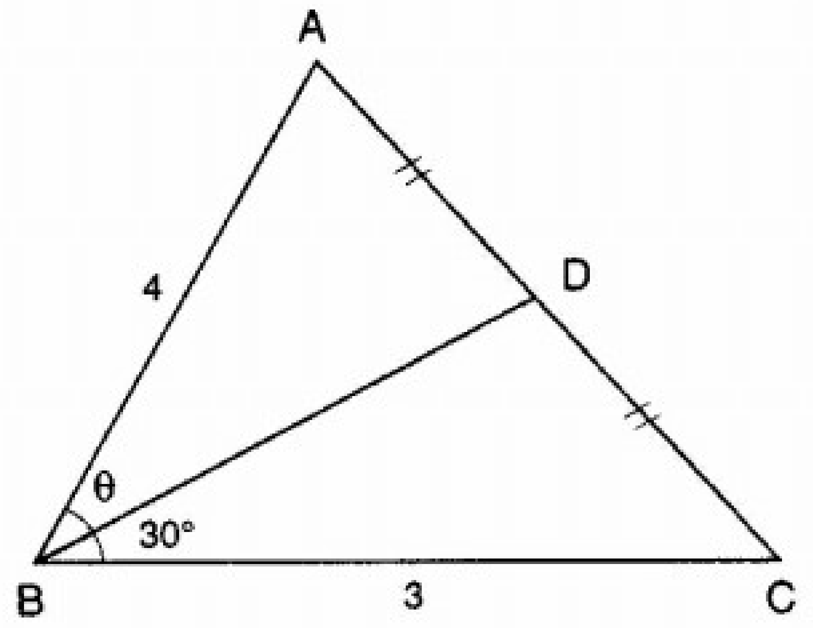
A) $\frac{1}{8}$

B) $\frac{1}{4}$

C) $\frac{3}{8}$

D) $\frac{1}{2}$

E) $\frac{5}{8}$



11. **$\sin(\widehat{B})$ = ?**

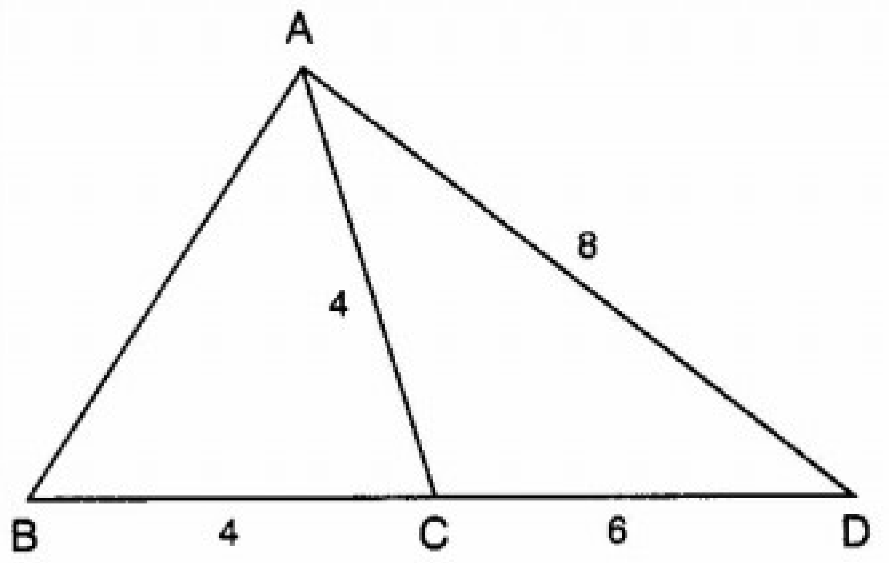
A) $\frac{\sqrt{6}}{4}$

B) $\frac{\sqrt{7}}{4}$

C) $\frac{\sqrt{10}}{4}$

D) $\frac{\sqrt{11}}{4}$

E) $\frac{\sqrt{15}}{4}$



12. **x = ?**

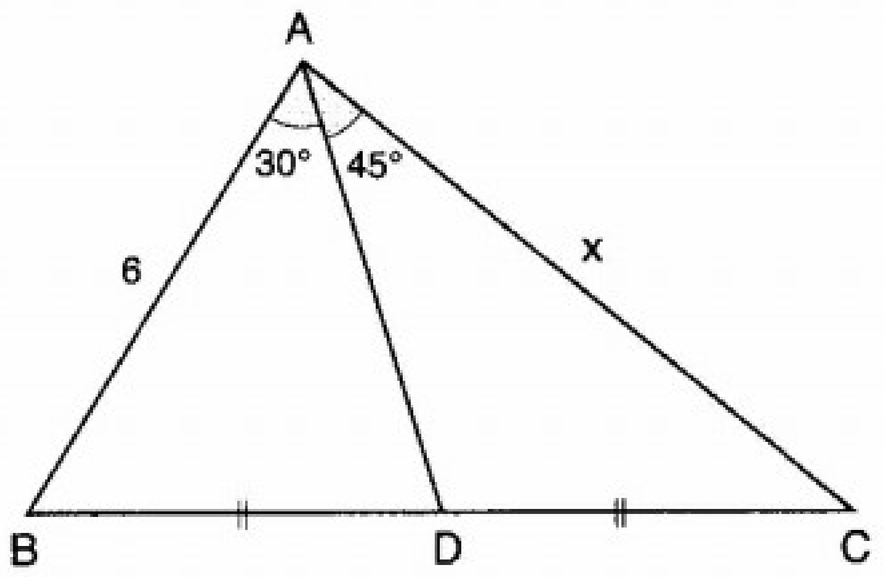
A) $2\sqrt{2}$

B) $3\sqrt{2}$

C) $4\sqrt{2}$

D) $2\sqrt{3}$

E) $3\sqrt{3}$


A
30°
45°
6
x
B
D
C

YANITLAR / ANSWERS

1. B	2. A	3. A	4. B	5. A	6. A	7. B	8. D
9. D	10. C	11. C	12. B				

1. $\tan 15° = ?$

A) $1 + \sqrt{3}$

B) $2 - \sqrt{3}$

C) $1 - \sqrt{3}$

D) $2 + \sqrt{3}$

E) $\dfrac{2-\sqrt{3}}{2}$

2. $\cot 105° = ?$

A) $2 + \sqrt{3}$

B) $2 - \sqrt{3}$

C) $-(2 - \sqrt{3})$

D) $\sqrt{3} + 1$

E) $-\sqrt{3} + 1$

3. $\cos 165° = ?$

A) $\dfrac{-\sqrt{6}+\sqrt{2}}{2}$

B) $\dfrac{-\sqrt{6}-\sqrt{2}}{4}$

C) $\dfrac{\sqrt{6}-\sqrt{2}}{4}$

D) $\dfrac{\sqrt{6}+\sqrt{2}}{4}$

E) $\dfrac{\sqrt{3}-\sqrt{2}}{2}$

4. $\dfrac{\pi}{2} < x < \dfrac{3\pi}{4}$, $\tan x = -3 \Rightarrow \cos 2x = ?$

A) $-\dfrac{2}{5}$

B) $-\dfrac{3}{5}$

C) $-\dfrac{4}{5}$

D) $-\dfrac{9}{10}$

E) $-\dfrac{14}{15}$

5. $0 < x < \dfrac{\pi}{2}$, $\sin x = 0{,}8 \Rightarrow \cos 2x - \sin 2x = ?$

A) $-\dfrac{31}{25}$

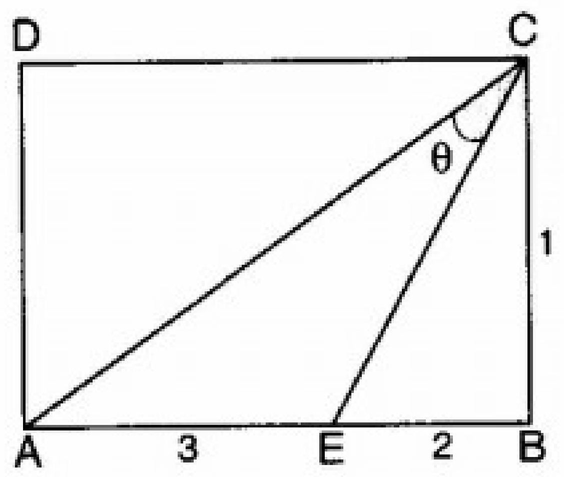
B) $-\dfrac{27}{25}$

C) -1

D) $-\dfrac{17}{25}$

E) $-\dfrac{12}{15}$

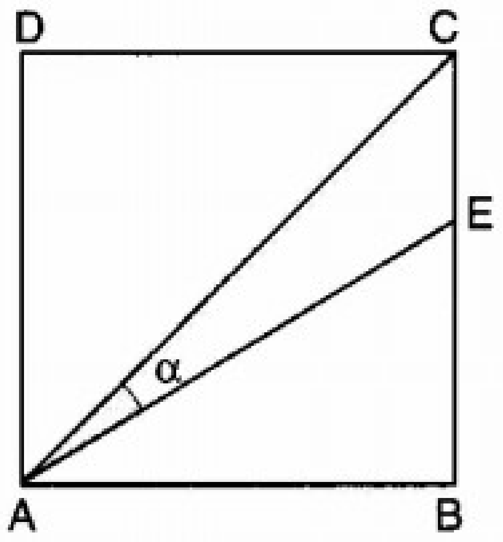
6. ABCD bir dikdörtgendir.
ABCD is a rectangle.
$|AE| = 3$ cm,
$|EB| = 2$ cm,
$|BC| = 1$ cm.
$\tan\theta = ?$



A) $\dfrac{1}{11}$ B) $\dfrac{2}{11}$ C) $\dfrac{3}{11}$

D) $\dfrac{4}{11}$ E) $\dfrac{5}{11}$

7. ABCD bir karedir.
ABCD is a square.
$2 \cdot |CE| = |EB|$.
$\tan\alpha = ?$



A) $\frac{5}{9}$

B) $\frac{1}{5}$

C) $\frac{9}{5}$

D) 5

E) $\frac{3}{5}$

8. $\cos 40° = 2m \Rightarrow$ **$\sin 12{,}5° \cdot \cos 12{,}5° \cdot \sin 65° = ?$**

A) 8m

B) 4m

C) 2m

D) $\frac{m}{2}$

E) $\frac{m}{4}$

9. $A = \sin\frac{\pi}{12} \cdot \cos\frac{\pi}{12} \cdot \cos\frac{\pi}{6} \Rightarrow$ **$A^2 = ?$**

A) $\frac{1}{64}$

B) $\frac{1}{32}$

C) $\frac{4}{3}$

D) $\frac{3}{64}$

E) 1

10. $0 < x < 90°$,

$$\frac{1+\cos 2x}{\sin 2x} = \sqrt{3} \Rightarrow \mathbf{x = ?}$$

A) 15°

B) 30°

C) 45°

D) 60°

E) 75°

11. $$\frac{1}{\cos 80°} - \frac{\sqrt{3}}{\sin 80°} = A \Rightarrow \mathbf{A = ?}$$

A) 4

B) 3

C) 2

D) 1

E) $\frac{1}{4}$

12. **$\sin^4 a - \cos^4 a = ?$**

A) cos2a

B) sin2a

C) 1

D) –sin2a

E) –cos2a

YANITLAR / ANSWERS

1. B	**2. C**	**3. B**	**4. C**	**5. A**	**6. C**	**7. B**	**8. D**
9. D	**10. B**	**11. A**	**12. E**				

1. $\tan 15° = \tan(45° - 30°)$

$$= \frac{\tan 45° - \tan 30°}{1 + \tan 45° \cdot \tan 30°}$$

$$= \frac{1 - \frac{\sqrt{3}}{3}}{1 + \frac{\sqrt{3}}{3}}$$

$$= \frac{3 - \sqrt{3}}{3 + \sqrt{3}}$$

$$= \frac{\left(3 - \sqrt{3}\right)^2}{\left(3 + \sqrt{3}\right)\left(3 - \sqrt{3}\right)} = \frac{12 - 6\sqrt{3}}{6}$$

$$= 2 - \sqrt{3}$$

Yanıt / The Answer is B

2. $\cot 105° = \cot(60° + 45°)$

$$= \frac{\cot 60° \cdot \cot 45° - 1}{\cot 60° + \cot 45°}$$

$$= \frac{\sqrt{3} - 3}{\sqrt{3} + 3}$$

$$= \frac{\left(\sqrt{3} - 3\right)^2}{\left(\sqrt{3} + 3\right) \cdot \left(\sqrt{3} - 3\right)}$$

$$= \frac{12 - 6\sqrt{3}}{3 - 9}$$

$$= -(2 - \sqrt{3})$$

Yanıt / The Answer is C

3. $\cos 165° = \cos(180° - 15°)$

$$= -\cos 15°$$

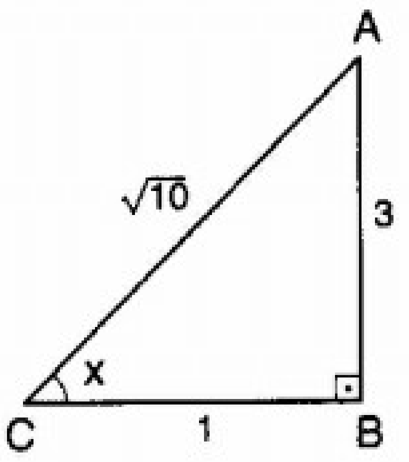
$$= -\cos(45° - 30°)$$

$$= -[\cos 45° \cdot \cos 30° + \sin 45° \cdot \sin 30°]$$

$$= -\left[\frac{\sqrt{2}}{2} \cdot \frac{\sqrt{3}}{2} + \frac{\sqrt{2}}{2} \cdot \frac{1}{2}\right] = \frac{-\sqrt{6} - \sqrt{2}}{4}$$

Yanıt / The Answer is B

4. $\tan x = -3 \Rightarrow \cos x = \frac{1}{\sqrt{10}}$



$$\cos 2x = 2\cos^2 x - 1$$

$$= 2 \cdot \left(\frac{1}{\sqrt{10}}\right)^2 - 1$$

$$= 2 \cdot \frac{1}{10} - 1$$

$$= \frac{2}{10} - 1$$

$$= -\frac{8}{10}$$

$$= -\frac{4}{5}$$

$|AC|^2 = |AB|^2 + |BC|^2$

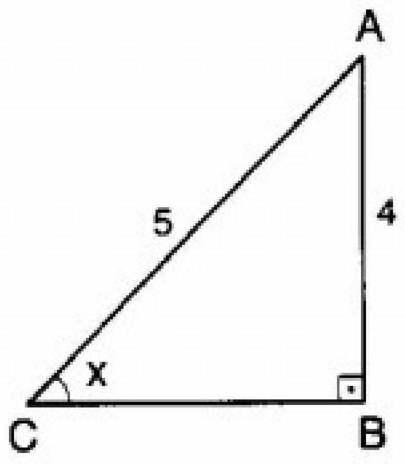
$|AC|^2 = 3^2 + 1^2$

$|AC| = 10$

$|AC| = \sqrt{10}$

Yanıt / The Answer is C

5. $\sin x = \frac{8}{10} = \frac{4}{5}$



$\cos x = \frac{3}{5}$

$\cos 2x - \sin 2x$

$= 2\cos^2 x - 1 - 2 \cdot \sin x \cdot \cos x$

$$= 2 \cdot \left(\frac{3}{5}\right)^2 - 1 - 2 \cdot \frac{4}{5} \cdot \frac{3}{5}$$

$$= \frac{18}{25} - \frac{25}{25} - \frac{24}{25} = -\frac{31}{25}$$

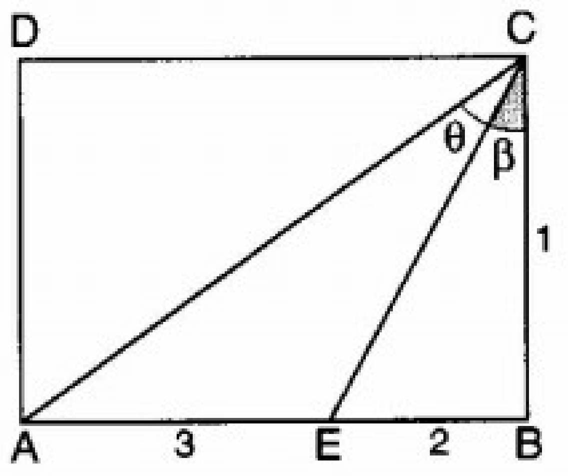
$|AC|^2 = |AB|^2 + |BC|^2$

$5^2 = 4^2 + |BC|^2$

$|BC| = 3$

Yanıt / The Answer is A

6. $\tan(\theta + \beta) = 5$



$$\frac{\tan\theta + \tan\beta}{1 - \tan\theta \cdot \tan\beta} = 5$$

$$\frac{\tan\theta + 2}{1 - 2\tan\theta} = 5$$

$$\tan\theta + 2 = 5 - 10\tan\theta$$

$$11\tan\theta = 3$$

$$\tan\theta = \frac{3}{11}$$

Yanıt / The Answer is C

7. $2 \cdot |CE| = |EB| \Rightarrow$

$|CE| = k\,,\ |EB| = 2k$

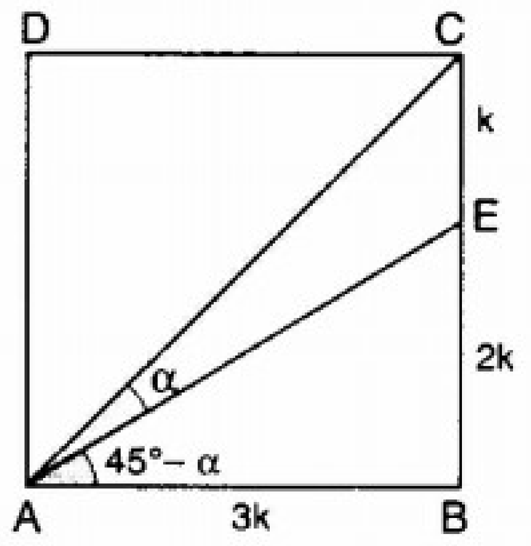
$\tan(\alpha + (45° - \alpha)) = \tan 45° = 1$

$$\frac{\tan\alpha + \tan(45° - \alpha)}{1 - \tan\alpha \cdot \tan(45° - \alpha)} = 1$$

$$\frac{\tan\alpha + \frac{2}{3}}{1 - \tan\alpha \cdot \frac{2}{3}} = 1$$

$$\frac{5}{3}\tan\alpha = \frac{1}{3}$$

$$\tan\alpha = \frac{1}{5}$$



Yanıt / The Answer is B

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8. $\sin 12{,}5° \cdot \cos 12{,}5° \cdot \sin 65° = \dfrac{\sin 25° \cdot \sin 65°}{2}$

$$\sin 25° = \cos 65° \Rightarrow \frac{\sin 25° \cdot \sin 65°}{2} = \frac{\cos 65° \cdot \sin 65°}{2}$$

$$= \frac{\sin 130°}{4}$$

$\sin 130° = \sin(90° + 40°) = \cos 40°$

$$\Rightarrow \frac{\sin 130°}{4} = \frac{2m}{4} = \frac{m}{2}$$

Yanıt / The Answer is D

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9. $A = \sin\dfrac{\pi}{12} \cdot \cos\dfrac{\pi}{12} \cdot \cos\dfrac{\pi}{6}$

$$= \frac{2 \cdot \sin\frac{\pi}{12} \cdot \cos\frac{\pi}{12} \cdot \cos\frac{\pi}{6}}{2}$$

$$= \frac{\sin\frac{\pi}{6} \cdot \cos\frac{\pi}{6}}{2} = \frac{\sin\frac{\pi}{3}}{4}$$

$$A^2 = \frac{\left(\sin\frac{\pi}{3}\right)^2}{16} = \frac{3}{64}$$

Yanıt / The Answer is D

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10. $\dfrac{1 + \cos 2x}{\sin 2x} = \sqrt{3}$

$$\frac{1 + 2\cos^2 x - 1}{2 \cdot \sin x \cdot \cos x} = \sqrt{3}$$

$$\frac{\cos x}{\sin x} = \sqrt{3}$$

$0 < x < 90° \Rightarrow x = 30°$

Yanıt / The Answer is B

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11. $\dfrac{1}{\cos 80°} - \dfrac{\sqrt{3}}{\sin 80°} = \dfrac{\sin 80° - \tan 60° \cdot \cos 80°}{\sin 80° \cdot \cos 80°}$

$$= \frac{\sin 80° - \frac{\sin 60°}{\cos 60°} \cdot \cos 80°}{\sin 80° \cdot \cos 80°}$$

$$= \frac{\sin 80° \cdot \cos 60° - \sin 60° \cdot \cos 80°}{\cos 60° \cdot \sin 80° \cdot \cos 80°}$$

$$= \frac{2 \cdot \sin 20°}{\frac{1}{2} \cdot 2 \cdot \sin 80° \cdot \cos 80°}$$

$$= \frac{2 \cdot \sin 20°}{\frac{1}{2} \cdot \sin 160°} = 4$$

Yanıt / The Answer is A

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12. $\sin^4 a - \cos^4 a = -(\cos^4 a - \sin^4 a)$

$= -(\cos^2 a - \sin^2 a) \cdot (\cos^2 a + \sin^2 a)$

$= -(\cos 2a) \cdot 1$

$= -\cos 2a$

Yanıt / The Answer is E

1. $\dfrac{\sin 77° + \cos 47°}{\sin 73°} = ?$

A) $2\sqrt{3}\sin 17°$

B) $\sqrt{3}$

C) $2\sqrt{3}$

D) $2\sqrt{2}\cos 17°$

E) $\tan 17°$

2. $\cos 105° - \cos 15° = ?$

A) $\dfrac{\sqrt{6}}{2}$

B) $-\dfrac{\sqrt{6}}{2}$

C) 0

D) 1

E) $\dfrac{\sqrt{3}}{2}$

3. $\dfrac{\sin 75° + \cos 5°}{\cos 75° - \sin 5°} = ?$

A) $\tan 10°$

B) 1

C) $\cot 10°$

D) $\cot 5°$

E) $\tan 5°$

4. $\tan 15° + \cot 15° = ?$

A) $\dfrac{\sqrt{3}}{2}$

B) $\dfrac{\sqrt{6} - \sqrt{2}}{4}$

C) $\dfrac{\sqrt{3} + 1}{2}$

D) 2

E) 4

5. $\dfrac{\cos 37° + \sin 37°}{\cos 37° - \sin 37°} = ?$

A) $\sin 8°$

B) $\cos 8°$

C) $\tan 8°$

D) $\cot 8°$

E) $\sec 8°$

6. $x = \dfrac{\pi}{17} \Rightarrow \dfrac{\cos 14x + \cos 12x}{\cos 3x + \cos 5x} = ?$

A) -2

B) $-\dfrac{3}{2}$

C) -1

D) 0

E) 1

7. $\dfrac{\sin 5a+\sin 4a+\sin 3a}{\sin 9a+\sin 8a+\sin 7a}=?$

A) $\sin 4a$

B) $\sin 8a$

C) $\tan 2a$

D) $\dfrac{\sec 4a}{2}$

E) $\dfrac{\sec 8a}{2}$

8. $16\cdot\sin 10°\cdot\sin 30°\cdot\sin 50°\cdot\sin 70° = ?$

A) 8

B) 4

C) 2

D) 1

E) $\dfrac{1}{2}$

9. $\cos 106°\cdot\sin 14° + \sin 30°\cdot\cos 2° = ?$

A) $-\dfrac{1}{4}$

B) $-\dfrac{1}{2}$

C) 0

D) $\dfrac{1}{2}$

E) $\dfrac{\sqrt{3}}{4}$

10. $\arccos 5x = \dfrac{\pi}{3} \Rightarrow x = ?$

A) $\dfrac{\sqrt{3}}{10}$

B) $\dfrac{\sqrt{2}}{10}$

C) $\dfrac{1}{10}$

D) $\dfrac{\sqrt{2}}{5}$

E) $\dfrac{\sqrt{3}}{5}$

11. $\sin\left(2\arcsin\dfrac{4}{5}\right) = ?$

A) $\dfrac{12}{25}$

B) $\dfrac{16}{25}$

C) $\dfrac{18}{25}$

D) $\dfrac{24}{25}$

E) 1

12. $x \in [0, \pi]$,

$\cos 2x + \cos x = 0 \Rightarrow$ **ÇK(SS) = ?**

A) $\left\{\dfrac{\pi}{2}, \dfrac{5\pi}{6}\right\}$ B) $\left\{\dfrac{\pi}{4}, \dfrac{\pi}{2}\right\}$ C) $\left\{\dfrac{\pi}{3}, \pi\right\}$

D) $\left\{\dfrac{\pi}{3}, \dfrac{3\pi}{4}\right\}$ E) $\left\{\dfrac{3\pi}{4}, \pi\right\}$

YANITLAR / ANSWERS

1. B	2. B	3. D	4. E	5. D	6. C	7. D	8. D
9. E	10. C	11. D	12. C				

1.

$$\frac{\sin 77^\circ+\cos 47^\circ}{\sin 73^\circ}=\frac{\sin 77^\circ+\sin 43^\circ}{\cos 17^\circ}$$

$$=\frac{2\cdot\sin\left(\frac{77^\circ+43^\circ}{2}\right)\cdot\cos\left(\frac{77^\circ-43^\circ}{2}\right)}{\cos 17^\circ}$$

$$=\frac{2\cdot\sin 60^\circ\cdot\cos 17^\circ}{\cos 17^\circ}$$

$$=2\cdot\frac{\sqrt{3}}{2}=\sqrt{3}$$

Yanıt / The Answer is B

2.

$$\cos 105^\circ-\cos 15^\circ=-2\sin\frac{105^\circ+15^\circ}{2}\cdot\sin\frac{105^\circ-15^\circ}{2}$$

$$=-2\sin 60^\circ\cdot\sin 45^\circ$$

$$=-2\cdot\frac{\sqrt{3}}{2}\cdot\frac{\sqrt{2}}{2}$$

$$=-\frac{\sqrt{6}}{2}$$

Yanıt / The Answer is B

3.

$$\frac{\sin 75^\circ+\cos 5^\circ}{\cos 75^\circ-\sin 5^\circ}=\frac{\sin 75^\circ+\sin 85^\circ}{\cos 75^\circ-\cos 85^\circ}$$

$$=\frac{2\cdot\sin\frac{75^\circ+85^\circ}{2}\cdot\cos\frac{85^\circ-75^\circ}{2}}{-2\cdot\sin\frac{75^\circ+85^\circ}{2}\cdot\sin\frac{75^\circ-85^\circ}{2}}$$

$$=\frac{2\cdot\sin 80^\circ\cdot\cos 5^\circ}{2\cdot\sin 80^\circ\cdot\sin 5^\circ}$$

$$=\cot 5^\circ$$

Yanıt / The Answer is D

4.

$$\tan 15^\circ+\cot 15^\circ=\tan 15^\circ+\tan 75^\circ$$

$$=\frac{\sin(15^\circ+75^\circ)}{\cos 15^\circ\cdot\cos 75^\circ}$$

$$=\frac{\sin 90^\circ}{\sin 75^\circ\cdot\cos 75^\circ}$$

$$=\frac{2\cdot\sin 90^\circ}{2\cdot\sin 75^\circ\cdot\cos 75^\circ}$$

$$=\frac{2}{\sin 150^\circ}=\frac{2}{\frac{1}{2}}=4$$

Yanıt / The Answer is E

5.

$$\frac{\cos 37^\circ+\sin 37^\circ}{\cos 37^\circ-\sin 37^\circ}=\frac{\cos 37^\circ+\cos 53^\circ}{\cos 37^\circ-\cos 53^\circ}$$

$$=\frac{2\cdot\cos\frac{37^\circ+53^\circ}{2}\cdot\cos\frac{53^\circ-37^\circ}{2}}{-2\cdot\sin\frac{37^\circ+53^\circ}{2}\cdot\sin\frac{37^\circ-53^\circ}{2}}$$

$$=\frac{2\cdot\cos 45^\circ\cdot\cos 8^\circ}{2\cdot\sin 45^\circ\cdot\sin 8^\circ}=\cot 8^\circ$$

Yanıt / The Answer is D

6.

$$\frac{\cos 14x+\cos 12x}{\cos 3x+\cos 5x}=\frac{2\cdot\cos\frac{14x+12x}{2}\cdot\cos\frac{14x-12x}{2}}{2\cdot\cos\frac{3x+5x}{2}\cdot\cos\frac{5x-3x}{2}}$$

$$=\frac{2\cdot\cos 13x\cdot\cos x}{2\cdot\cos 4x\cdot\cos x}$$

$$=\frac{\cos 13x}{\cos 4x}$$

$$13x+4x=\pi\ \Rightarrow\ \frac{\cos 13x}{\cos 4x}=-1$$

Yanıt / The Answer is C

7. $$\frac{\sin 5a+\sin 4a+\sin 3a}{\sin 9a+\sin 8a+\sin 7a}$$

$$=\frac{2\cdot\sin\frac{5a+3a}{2}\cdot\cos\frac{5a-3a}{2}+\sin 4a}{2\cdot\sin\frac{9a+7a}{2}\cdot\cos\frac{9a-7a}{2}+\sin 8a}$$

$$=\frac{2\cdot\sin 4a\cdot\cos a+\sin 4a}{2\cdot\sin 8a\cdot\cos a+\sin 8a}$$

$$=\frac{\sin 4a(2\cos a+1)}{\sin 8a(2\cos a+1)}$$

$$=\frac{\sin 4a}{2\cdot\sin 4a\cdot\cos 4a}=\frac{1}{2\cos 4a}=\frac{1}{2}\sec 4a$$

Yanıt / The Answer is D

8. $16\cdot\sin 10°\cdot\sin 30°\cdot\sin 50°\cdot\sin 70°$

$$=16\cdot\sin 10°\cdot\frac{1}{2}\cdot\sin 50°\cdot\sin 70°$$

$$=8\cdot\left[-\frac{1}{2}(\cos 80°-\cos 60°)\right]\cdot\sin 50°$$

$$=(-4\cdot\cos 80°+2)\cdot\sin 50°$$

$$=-4\cdot\cos 80°\cdot\sin 50°+2\cdot\sin 50°$$

$$=-4\cdot\left[\frac{1}{2}(\sin 130°-\sin 30°)\right]+2\cdot\sin 50°$$

$$=-2\cdot\sin 130°-(-2)\cdot\left(\frac{1}{2}\right)+2\cdot\sin 50°$$

$$=1$$

Yanıt / The Answer is D

9. $\cos 106°\cdot\sin 14°+\sin 30°\cdot\cos 2°$

$$=\frac{1}{2}\cdot(\sin 120°-\sin 92°)+\frac{1}{2}\cdot\cos 2°$$

$$=\frac{1}{2}\left(\frac{\sqrt{3}}{2}-\cos 2°\right)+\frac{1}{2}\cos 2°$$

$$=\frac{\sqrt{3}}{4}-\frac{1}{2}\cos 2°+\frac{1}{2}\cos 2°$$

$$=\frac{\sqrt{3}}{4}$$

Yanıt / The Answer is E

10. $\arccos 5x=\frac{\pi}{3}\Rightarrow\cos\frac{\pi}{3}=5x$

$$\frac{1}{2}=5x$$

$$x=\frac{1}{10}$$

Yanıt / The Answer is C

11. $\arcsin\frac{4}{5}=x\ \Rightarrow\ \sin x=\frac{4}{5}$

$$\sin x=\frac{4}{5}\ \Rightarrow\ \cos x=\frac{3}{5}$$

$$\sin\left(2\arcsin\frac{4}{5}\right)=\sin 2x$$

$$\sin 2x=2\cdot\sin x\cdot\cos x$$

$$=2\cdot\frac{4}{5}\cdot\frac{3}{5}$$

$$=\frac{24}{25}$$

Yanıt / The Answer is D

12. $\cos 2x+\cos x=0$

$$2\cos^2 x-1+\cos x=0$$

$$(2\cos x-1)\cdot(\cos x+1)=0$$

$$\cos x=\frac{1}{2}\ ,\quad \cos x=-1$$

$$x\in[0,\pi]\Rightarrow x_1=\frac{\pi}{3}\ ,\quad x_2=\pi$$

$$\text{ÇK(SS)}=\left\{\frac{\pi}{3},\pi\right\}$$

Yanıt / The Answer is C

1. $\cos 105° = ?$

Yanıt / The Answer is: $\frac{\sqrt{2}-\sqrt{6}}{4}$

2. $\sin 72°\cdot\cos 18° + \sin 18°\cdot\cos 72° = ?$

Yanıt / The Answer is: **1**

3. $x + y = \frac{\pi}{6}$

$\sin x + \cos y = A$, $\cos x + \sin y = B \Rightarrow A^2 + B^2 = ?$

Yanıt / The Answer is: **3**

4. $\frac{\cos 3a}{\sin a} + \frac{\sin 3a}{\cos a} = ?$

Yanıt / The Answer is: **2cot 2a**

5. $A = \sin 10° + \tan 40° \cdot \cos 10° \Rightarrow A = ?$

Yanıt / The Answer is: **1**

6. $\tan x = \frac{3}{5} \Rightarrow \sin 2x = ?$

Yanıt / The Answer is: $\frac{15}{17}$

7. $2\sin5°\cdot\cos5°\cdot\cos10° = a \Rightarrow \mathbf{\cos40° = ?}$

Yanıt / The Answer is: $\mathbf{1 - 8a^2}$

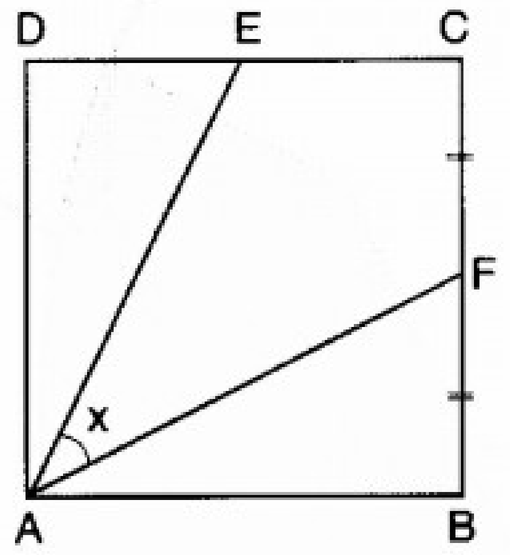
8. ABCD bir karedir.

ABCD is a square.

$|BF| = |FC|$,

$|EC| = 2|DE|$

$\Rightarrow \mathbf{m(\widehat{EAF}) = x = ?}$



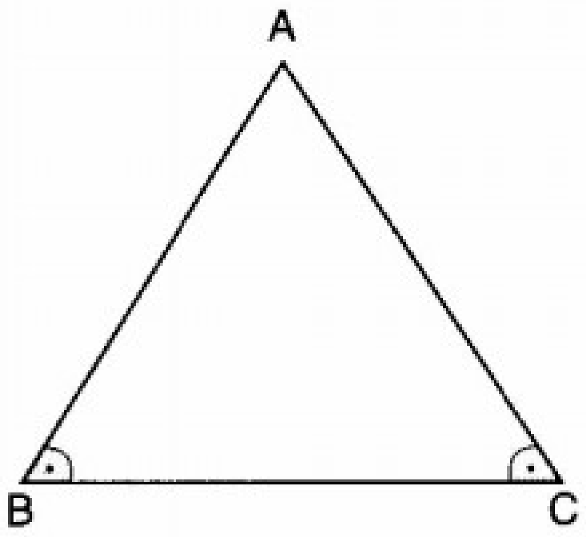
Yanıt / The Answer is: $\mathbf{\frac{\pi}{4}}$

9. ABC üçgeni ikizkenardır.

ABC is an isosceles triangle.

$m(\widehat{B}) = m(\widehat{C})$,

$\tan A = \frac{5}{12} \Rightarrow \mathbf{\cos\widehat{C} = ?}$



Yanıt / The Answer is: $\mathbf{\frac{1}{\sqrt{26}}}$

10. $\mathbf{\frac{\cos40°}{\sin10°} - \frac{\sin40°}{\cos10°} = ?}$

Yanıt / The Answer is: $\mathbf{4\cos20°}$

11. $\left.\begin{array}{l} a = \cos12°\cdot\cos18° \\ b = \cos78°\cdot\cos72° \end{array}\right\} \Rightarrow \mathbf{a - b = ?}$

Yanıt / The Answer is: $\mathbf{\frac{\sqrt{3}}{2}}$

12. $\cos16° = a \Rightarrow \mathbf{\sin58° = ?}$

Yanıt / The Answer is: $\mathbf{2a^2 - 1}$

13. $x + 2y = \frac{\pi}{2}$

$\Rightarrow \sin(2x + 2y) - \sin 2y = ?$

Yanıt / The Answer is: **0**

14. $\sin 2a = \frac{3}{5} \quad \Rightarrow \quad \tan a = ?$

Yanıt / The Answer is: $\frac{1}{3}$

15. $\frac{\cos 4x - \cos 8x}{\cos 8x - \cos 4x} = ?$

Yanıt / The Answer is: **–1**

16. $\cos 40° + \cos 80° = ?$

Yanıt / The Answer is: **cos20°**

17. $\sin 75° + \sin 15° = ?$

Yanıt / The Answer is: $\frac{\sqrt{6}}{2}$

18. $16x = \pi$

$\Rightarrow \frac{\sin 12x - \sin 8x}{\cos 16x + \cos 4x} = ?$

Yanıt / The Answer is: **1**

19. $\dfrac{\sin 2x+\sin 3x+\sin 4x}{\cos 2x+\cos 3x+\cos 4x}=?$

Yanıt / The Answer is: **tan3x**

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20. $\cos\left(\arcsin\left(\dfrac{1}{2}\right)\right)=?$

Yanıt / The Answer is: $\dfrac{\sqrt{3}}{2}$

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21. $\arccos x = 12° \Rightarrow \sin 66° = ?$

Yanıt / The Answer is: $2x^2-1$

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22. $\arctan\dfrac{1}{3}+\arctan\dfrac{1}{2}=?$

Yanıt / The Answer is: $\dfrac{\pi}{4}$

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23. $\arctan\dfrac{1}{3}+\arctan 3=?$

Yanıt / The Answer is: **90°**

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24. $3\cos x + 4\sin x = A \Rightarrow \max(A) = ?$

Yanıt / The Answer is: **5**

1. **$\sin 28° \cdot \cos 32° + \cos 28° \cdot \sin 32° = ?$**

A) 0

B) $\frac{1}{2}$

C) $\frac{\sqrt{2}}{2}$

D) $\frac{\sqrt{3}}{2}$

E) 1

2. **$\cos 40° \cdot \cos 10° + \cos 50° \cdot \cos 80° = ?$**

A) 1

B) $\frac{\sqrt{3}}{2}$

C) $\frac{\sqrt{2}}{2}$

D) $\frac{1}{2}$

E) 0

3. **$\tan 75° = ?$**

A) $1 + \sqrt{3}$

B) $2 + \sqrt{3}$

C) $3 + \sqrt{3}$

D) $4 + \sqrt{3}$

E) $5 + \sqrt{3}$

4. $\left.\begin{matrix}\tan x = 2 \\ \cot y = 3\end{matrix}\right\} \Rightarrow \tan(x+y) = ?$

A) -7

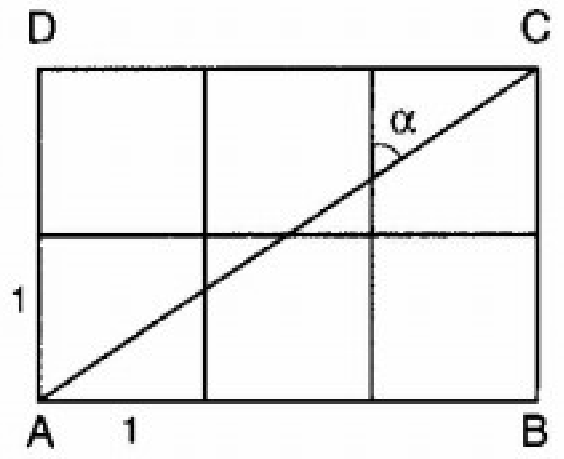
B) $-\frac{5}{3}$

C) -1

D) $\frac{5}{3}$

E) 7

5. **$\sin\alpha + \cos\alpha = ?$**



A) $\frac{\sqrt{13}}{13}$

B) $\frac{\sqrt{13}}{5}$

C) $\frac{5\sqrt{13}}{13}$

D) $\frac{3\sqrt{13}}{13}$

E) $\frac{4\sqrt{13}}{13}$

6. $\frac{\sin 20° + \sqrt{3} \cdot \cos 20°}{\cos 10°} = ?$

A) $\frac{1}{2}$

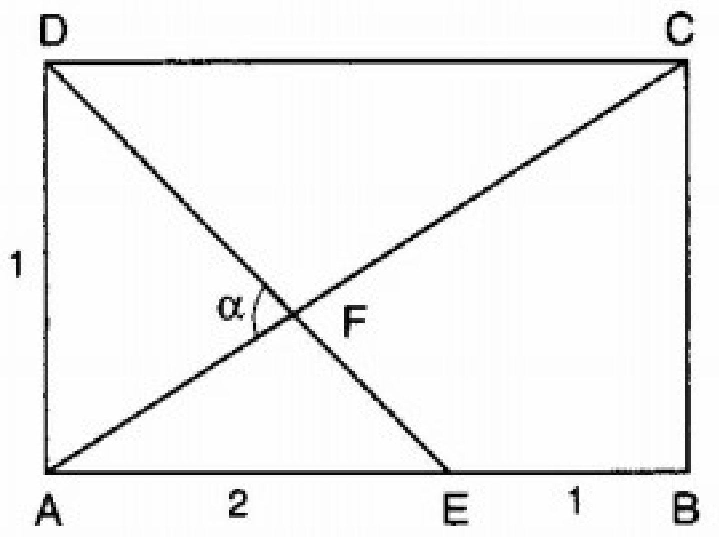
B) $\frac{\sqrt{2}}{2}$

C) $\frac{\sqrt{3}}{2}$

D) 1

E) 2

7.



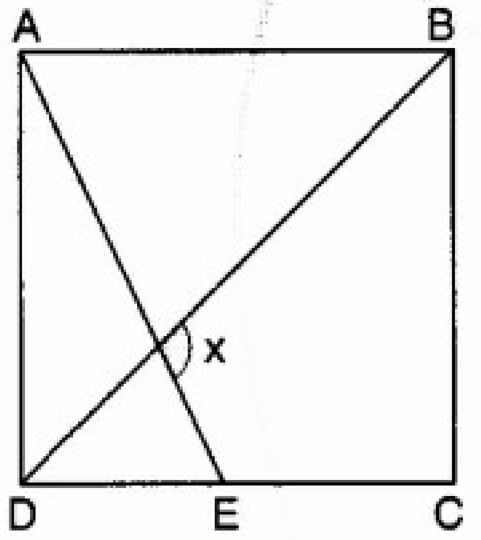
ABCD bir dikdörtgendir. / ABCD is a rectangle.

$|AD| = 1$, $|EB| = 1$, $|AE| = 2$ $\Rightarrow$ **$\tan\alpha$ = ?**

A) $-\frac{1}{3}$ B) $-\frac{1}{6}$ C) 1

D) $\frac{1}{6}$ E) $\frac{1}{3}$

8.



ABCD bir karedir. / ABCD is a square.

$3 \cdot |DC| = 4 \cdot |DE| \Rightarrow$ **$\sin x$ = ?**

A) $\frac{7\sqrt{2}}{5}$ B) $\frac{2\sqrt{2}}{5}$ C) $\frac{\sqrt{2}}{10}$

D) $\frac{\sqrt{3}}{15}$ E) $\frac{7\sqrt{2}}{10}$

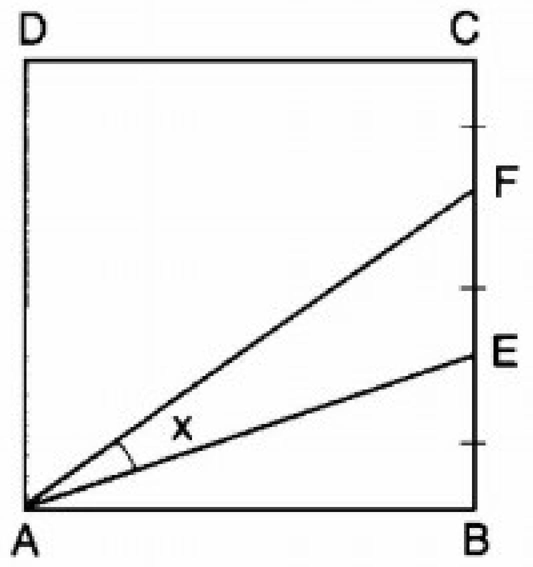
---

9. ABCD bir karedir.

ABCD is a square.

$|CF| = |FE| = |EB|$

$\Rightarrow$ **$\tan x$ = ?**



A) $\frac{1}{7}$ B) $\frac{1}{8}$ C) $\frac{1}{9}$

D) $\frac{1}{11}$ E) $\frac{3}{11}$

---

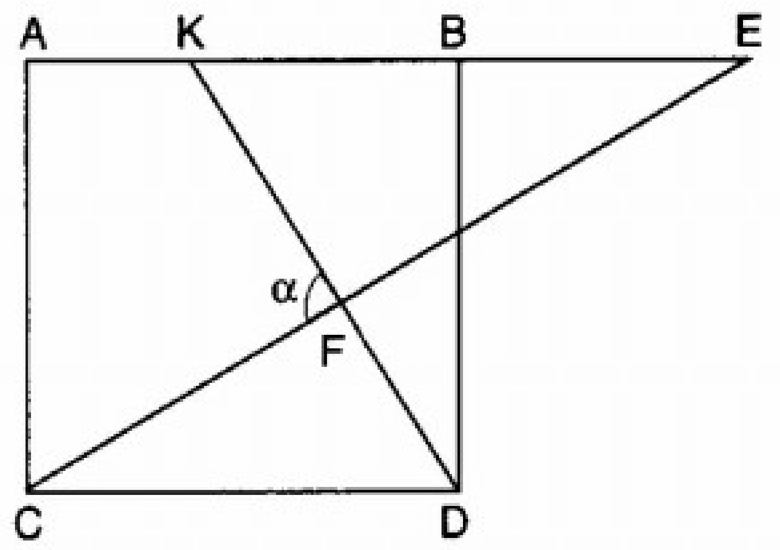
10 ABCD bir karedir.

ABCD is a square.

$2|KB| = 6|KA| = 3|BE|$

$m(\widehat{KFD}) = \alpha$

$\Rightarrow$ **$\cot\alpha$ = ?**



A) 18 B) 16 C) 1

D) $\frac{1}{16}$ E) $\frac{1}{18}$

---

11. $\dfrac{\tan^2 x - \tan^2 y}{1 - \tan^2 x \cdot \tan^2 y} = ?$

A) $\tan(x - y)$

B) 1

C) -1

D) $\tan(x + y)$

E) $\tan(x - y) \cdot \tan(x + y)$

---

12. $A = 4\sin x + 8\cos x$ $\Rightarrow$ **max(A) = ?**

A) $\sqrt{5}$

B) $2\sqrt{5}$

C) $3\sqrt{5}$

D) $4\sqrt{5}$

E) 10

YANITLAR / ANSWERS

1. D	**2. B**	**3. B**	**4. E**	**5. C**	**6. E**	**7. C**	**8. E**
9. E	**10. E**	**11. E**	**12. D**				

1. $\sin x - \cos x = \frac{3}{4} \Rightarrow \mathbf{\sin 2x = ?}$

A) $-\frac{7}{32}$

B) $-\frac{7}{16}$

C) $\frac{7}{16}$

D) $\frac{7}{32}$

E) $\frac{9}{16}$

2. $\sin^2 \frac{\pi}{8} = ?$

A) $\frac{2-\sqrt{2}}{4}$

B) $\frac{\sqrt{2}}{4}$

C) $\frac{\sqrt{2}}{2}$

D) $\sqrt{2}-1$

E) $\frac{2\sqrt{2}+1}{2}$

3. $\frac{\sin^4 x + 2\cos^2 x - 1}{\cos^4 x} = ?$

A) cos2x

B) –sin2x

C) 1

D) –cos2x

E) sin2x

4. $\cot x = 3 \Rightarrow \mathbf{\sin 2x = ?}$

A) $\frac{1}{5}$

B) $\frac{2}{5}$

C) $\frac{3}{5}$

D) $\frac{4}{5}$

E) 1

5. $0 < x < \frac{\pi}{2}$, $\cos 2x = -\frac{7}{9} \Rightarrow \mathbf{\tan x = ?}$

A) $-2\sqrt{2}$

B) $-\sqrt{2}$

C) 1

D) $\sqrt{2}$

E) $2\sqrt{2}$

6. $\sin 20° = a \Rightarrow \mathbf{\cos 40° \cdot \cos 50° \cdot \cos 80° = ?}$

A) $\frac{a}{4}$

B) $\frac{a}{2}$

C) a

D) 2a

E) 4a

7. $\dfrac{\sin 21°}{\sin 7°} - \dfrac{\cos 21°}{\cos 7°} = ?$

A) $\dfrac{1}{8}$

B) $\dfrac{1}{4}$

C) $\dfrac{1}{2}$

D) 1

E) 2

---

8. $\cos^2 \dfrac{\pi}{12} + \sin^2 \dfrac{5\pi}{12} = ?$

A) $\dfrac{2+\sqrt{3}}{2}$

B) $\dfrac{3+\sqrt{3}}{3}$

C) $\dfrac{2+\sqrt{2}}{2}$

D) $\dfrac{3+\sqrt{2}}{3}$

E) $\dfrac{\sqrt{2}+\sqrt{3}}{2}$

---

9. $\sin 14° = a \Rightarrow \sin 62° = ?$

A) $1 - a$

B) $1 + a$

C) a^2

D) $1 - 2a^2$

E) $1 + 2a^2$

---

10. $\dfrac{1-\cos 2x}{\sin x} = ?$

A) $\cot x$

B) $\tan x$

C) $-\tan x$

D) $\sin x$

E) $2 \cdot \sin x$

---

11. $\dfrac{1-\cos 32°}{\sin^2 16°} = ?$

A) 2

B) 1

C) 0

D) -1

E) -2

---

12. $\tan \dfrac{x}{2} = \dfrac{4}{3} \Rightarrow \tan \dfrac{3x}{4} = ?$

A) $\dfrac{5}{2}$

B) $\dfrac{7}{2}$

C) $\dfrac{9}{2}$

D) $\dfrac{11}{2}$

E) $\dfrac{13}{2}$

YANITLAR / ANSWERS							
1. C	2. A	3. C	4. C	5. E	6. A	7. E	8. A
9. D	10. E	11. A	12. D				

1. $x = \frac{\pi}{30} \Rightarrow \frac{\cos 14x + \cos 6x}{\cos 4x} = ?$

A) $\frac{1}{2}$

B) $-\frac{1}{2}$

C) 1

D) -1

E) $\frac{\sqrt{3}}{4}$

2. $a = \frac{\pi}{15} \Rightarrow \frac{\cos 7a + \cos 5a}{\cos a \cdot \cos 9a} = ?$

A) -3

B) -2

C) 0

D) 1

E) 2

3. $x = \frac{\pi}{12} \Rightarrow \frac{\sin 3x + \sin 11x}{\sin 5x \cdot \cos 4x} = ?$

A) -2

B) -1

C) 1

D) $\frac{1}{2}$

E) 2

4. $\frac{\sin 82° + \sin 22°}{\sin 68° - \sin 8°} = ?$

A) $-\sqrt{3}$

B) $-\frac{\sqrt{3}}{3}$

C) $\frac{\sqrt{3}}{3}$

D) $\frac{\sqrt{3}}{2}$

E) $\sqrt{3}$

5. $x + y = \frac{\pi}{3} \Rightarrow \frac{\sin x - \sin y}{\cos y - \cos x} = ?$

A) $\sqrt{3}$

B) $\sqrt{2}$

C) $-\sqrt{3}$

D) $-\frac{\sqrt{3}}{2}$

E) -1

6. $\frac{\sin 75° - \cos 75°}{\sin 75° + \cos 75°} = ?$

A) $\frac{\sqrt{2}}{2}$

B) $\frac{\sqrt{6}}{2}$

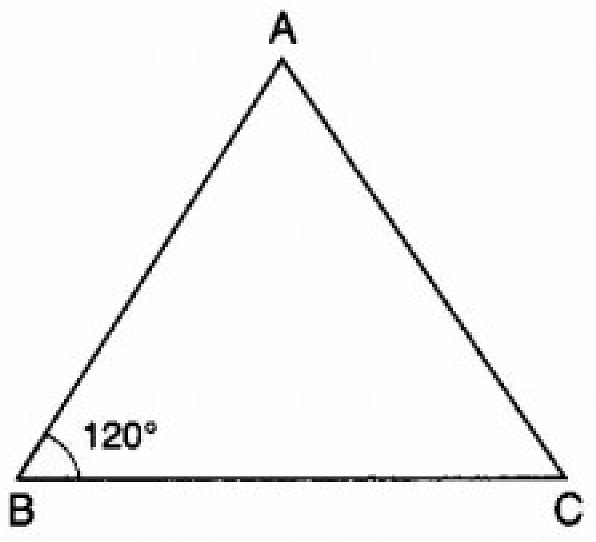
C) $\frac{1}{2}$

D) $\frac{\sqrt{3}}{2}$

E) $\frac{\sqrt{3}}{3}$

7. $m(\widehat{B}) = 120°$

$$\Rightarrow \frac{\sin\widehat{A} + \sin\widehat{C}}{\cos\widehat{A} + \cos\widehat{C}} = ?$$



A) $\frac{\sqrt{3}}{2}$

B) $\frac{\sqrt{3}}{4}$

C) $\frac{\sqrt{3}}{3}$

D) $\sqrt{3}$

E) $\frac{1}{2}$

8. $\frac{\sin x + \sin 2x + \sin 3x}{1 + \cos x + \cos 2x} = ?$

A) sinx

B) 2sinx

C) cosx

D) 2cosx

E) sin2x

9. $\frac{\sin 42° + \sin 50° + \sin 58°}{\cos 42° + \cos 50° + \cos 58°} = ?$

A) tan40°

B) cot40°

C) cot38°

D) tan42°

E) tan58°

10. $\frac{\sin 10x - \sin 6x - \sin 2x}{\sin 9x - \sin 7x - \sin x} = ?$

A) 2sinx

B) 2tan4x

C) cot3x

D) 2cosx

E) sin2x

11. $\cos 190° \cdot \cos 70° \cdot \cos 50° = ?$

A) $\frac{\sqrt{3}}{8}$

B) $\frac{\sqrt{3}}{4}$

C) $-\frac{\sqrt{3}}{2}$

D) $-\frac{\sqrt{3}}{4}$

E) $-\frac{\sqrt{3}}{8}$

12. $\sin 10° \cdot \sin 30° \cdot \sin 50° \cdot \sin 70° = ?$

A) $\frac{1}{4}$

B) $\frac{1}{8}$

C) $\frac{1}{16}$

D) $\frac{1}{32}$

E) $\frac{1}{64}$

YANITLAR / ANSWERS

1. C	2. B	3. E	4. E	5. A	6. E	7. C	8. B
9. B	10. D	11. E	12. C				

1. $\arccos\left(-\frac{1}{2}\right) = ?$

A) $\frac{\pi}{6}$

B) $\frac{\pi}{3}$

C) π

D) $\frac{2\pi}{3}$

E) $\frac{5\pi}{6}$

2. $\tan\left(\arcsin\frac{4}{5}\right) = ?$

A) $\frac{1}{3}$

B) $\frac{2}{3}$

C) 1

D) $\frac{4}{3}$

E) $\frac{5}{3}$

3. $\sin\left(\arctan\frac{1}{3} + \arctan\frac{\sqrt{6}}{2}\right) = ?$

A) $\frac{2+\sqrt{6}}{10}$

B) $\frac{1+2\sqrt{6}}{10}$

C) $\frac{2+3\sqrt{6}}{10}$

D) $\frac{1+4\sqrt{6}}{10}$

E) $\frac{3+\sqrt{6}}{10}$

4. $\cos\left(2\arcsin\frac{2}{3}\right) = ?$

A) $\frac{1}{7}$

B) $\frac{1}{8}$

C) $\frac{1}{9}$

D) $\frac{1}{10}$

E) $\frac{1}{12}$

5. $\arctan\frac{1}{2} + \arctan\frac{1}{3} = ?$

A) $\frac{\pi}{2}$

B) $\frac{\pi}{3}$

C) $\frac{\pi}{4}$

D) $\frac{\pi}{5}$

E) $\frac{\pi}{6}$

6. $\arctan(-\sqrt{3}) + \arccos\left(-\frac{1}{2}\right) = ?$

A) $\frac{\pi}{3}$

B) $\frac{2\pi}{3}$

C) $\frac{\pi}{4}$

D) $\frac{3\pi}{4}$

E) π

7. $\arcsin\left(-\frac{\sqrt{3}}{2}\right) + \operatorname{arccot} 1 = ?$

A) $-\frac{\pi}{12}$

B) $-\frac{\pi}{6}$

C) $-\frac{\pi}{5}$

D) $-\frac{\pi}{4}$

E) $-\frac{\pi}{3}$

8. $\sin(\arctan -2) = ?$

A) $-\frac{3\sqrt{5}}{5}$

B) $-\frac{2\sqrt{5}}{5}$

C) $-\frac{\sqrt{5}}{5}$

D) $\frac{\sqrt{5}}{5}$

E) $\frac{2\sqrt{5}}{5}$

9. $\sin\left(\operatorname{arccot} -\frac{1}{3}\right) = ?$

A) $\frac{3\sqrt{10}}{10}$

B) $-\frac{2\sqrt{10}}{10}$

C) $-\frac{\sqrt{10}}{10}$

D) $\frac{\sqrt{10}}{10}$

E) $\frac{2\sqrt{10}}{10}$

10. $\tan\left(\arcsin\frac{\sqrt{5}}{5}\right) = ?$

A) $\frac{1}{2}$

B) $\frac{1}{3}$

C) $\frac{1}{4}$

D) $\frac{1}{5}$

E) $\frac{1}{6}$

11. $\arccos x + \arcsin x = ?$

A) $\frac{\pi}{6}$

B) $\frac{\pi}{5}$

C) $\frac{\pi}{4}$

D) $\frac{\pi}{3}$

E) $\frac{\pi}{2}$

12. $\arcsin\left(\cos\left(-\frac{\pi}{6}\right)\right) = ?$

A) $\frac{\pi}{3}$
B) $\frac{\pi}{4}$
C) $\frac{\pi}{5}$
D) $\frac{\pi}{6}$
E) $\frac{\pi}{8}$

YANITLAR / ANSWERS

1. D 2. D 3. C 4. C 5. C 6. A 7. A 8. B
9. A 10. A 11. E 12. A

1. $\sin x = \frac{1}{2} \Rightarrow$ **ÇK(SS) = ?**

A) $\left\{x \mid x = \frac{\pi}{3} + 2k\pi \vee x = \frac{2\pi}{3} + 2k\pi\right\}$

B) $\left\{x \mid x = \frac{\pi}{6} + 2k\pi \vee x = \frac{5\pi}{6} + 2k\pi\right\}$

C) $\left\{x \mid x = \frac{\pi}{4} + 2k\pi \vee x = \frac{3\pi}{4} + 2k\pi\right\}$

D) $\left\{x \mid x = \frac{3\pi}{5} + 2k\pi \vee x = \frac{2\pi}{5} + 2k\pi\right\}$

E) $\left\{x \mid x = \frac{\pi}{2} + 2k\pi \vee x = \frac{3\pi}{2} + 2k\pi\right\}$

2. $\cos x = -1 \Rightarrow$ **ÇK(SS) = ?**

A) $\{x \mid x = \pi + 2k\pi\}$

B) $\left\{x \mid x = \frac{\pi}{2} + 2k\pi\right\}$

C) $\left\{x \mid x = \frac{3\pi}{2} + 2k\pi\right\}$

D) $\left\{x \mid x = \frac{11\pi}{6} + 2k\pi\right\}$

E) $\{x \mid x = 2k\pi\}$

3. $\sin 4x = \sin\left(x + \frac{\pi}{4}\right) \Rightarrow$ **ÇK(SS) = ?**

A) $\left\{x \mid x = \frac{\pi}{3} + \frac{2k\pi}{4} \vee x = \frac{\pi}{4} + \frac{2k\pi}{3}\right\}$

B) $\left\{x \mid x = \frac{\pi}{6} + \frac{2k\pi}{5} \vee x = \frac{3\pi}{2} + 2k\pi\right\}$

C) $\left\{x \mid x = \frac{\pi}{2} + 2k\pi \vee x = \frac{3\pi}{4} + 2k\pi\right\}$

D) $\left\{x \mid x = \frac{\pi}{6} + \frac{2k\pi}{6} \vee x = \frac{2\pi}{5} + \frac{2k\pi}{5}\right\}$

E) $\left\{x \mid x = \frac{\pi}{12} + \frac{2k\pi}{3} \vee x = \frac{3\pi}{20} + \frac{2k\pi}{5}\right\}$

4. $2\cos^2 x + 5\cos x - 3 = 0 \Rightarrow$ **ÇK(SS) = ?**

A) $\left\{x \mid x = \frac{\pi}{6} + 2k\pi \vee x = \frac{5\pi}{6} + 2k\pi\right\}$

B) $\left\{x \mid x = \frac{\pi}{4} + 2k\pi \vee x = \frac{3\pi}{4} + 2k\pi\right\}$

C) $\left\{x \mid x = \frac{\pi}{3} + 2k\pi \vee x = \frac{5\pi}{3} + 2k\pi\right\}$

D) $\left\{x \mid x = \frac{3\pi}{7} + 2k\pi \vee x = \frac{4\pi}{7} + 2k\pi\right\}$

E) $\left\{x \mid x = \frac{\pi}{2} + 2k\pi \vee x = \pi + 2k\pi\right\}$

5. $\cos 3x = \cos\frac{4\pi}{5} \Rightarrow$ **ÇK(SS) = ?**

A) $\left\{x \mid x = \frac{5\pi}{12} + \frac{2k\pi}{4} \vee x = \frac{4\pi}{3} + \frac{2k\pi}{5}\right\}$

B) $\left\{x \mid x = \frac{4\pi}{15} + \frac{2k\pi}{3} \vee x = \frac{2\pi}{5} + \frac{2k\pi}{3}\right\}$

C) $\left\{x \mid x = \frac{3\pi}{8} + \frac{2k\pi}{3} \vee x = \frac{\pi}{6} + \frac{2k\pi}{3}\right\}$

D) $\left\{x \mid x = \frac{\pi}{3} + \frac{k\pi}{4} \vee x = \frac{2\pi}{3} + \frac{k\pi}{4}\right\}$

E) $\left\{x \mid x = \frac{3\pi}{4} + \frac{k\pi}{5} \vee x = \frac{\pi}{3} + \frac{k\pi}{5}\right\}$

6. $x \in [0, \pi)$,
$2\sin x + \cos 2x = 1 \Rightarrow$ **ÇK(SS) = ?**

A) $\left\{\frac{\pi}{3}, \frac{2\pi}{3}\right\}$

B) $\left\{\frac{\pi}{4}, \frac{3\pi}{4}\right\}$

C) $\left\{\frac{\pi}{2}, \frac{3\pi}{4}\right\}$

D) $\left\{0, \frac{\pi}{2}\right\}$

E) $\left\{\frac{\pi}{2}, \frac{3\pi}{4}\right\}$

7. $x \in [0, \pi]$,

$\sin^3 x - \frac{1}{4}\sin x = 0 \Rightarrow \boldsymbol{\sum x = ?}$

A) 0

B) $\frac{\pi}{2}$

C) π

D) $\frac{3\pi}{2}$

E) 2π

8. $x \in [0, \pi]$,

$\sin 2x - \cos x = 0 \Rightarrow \boldsymbol{\sum x = ?}$

A) 0

B) $\frac{\pi}{3}$

C) $\frac{\pi}{4}$

D) $\frac{\pi}{2}$

E) $\frac{3\pi}{2}$

9. $x \in [0, \pi]$,

$\cos^2 x + 3\cos x - 4 = 0 \Rightarrow \boldsymbol{\sum x = ?}$

A) 0

B) $\frac{\pi}{6}$

C) $\frac{\pi}{2}$

D) $\frac{3\pi}{4}$

E) π

10. $\sin 2x = \cos\left(x + \frac{\pi}{3}\right) \Rightarrow$ **ÇK(SS) = ?**

A) $\left\{x \mid x = \frac{\pi}{3} + \frac{2k\pi}{3} \vee x = \frac{2\pi}{3} + \frac{2k\pi}{3}\right\}$

B) $\left\{x \mid x = \frac{4\pi}{3} + \frac{2k\pi}{3} \vee x = \frac{\pi}{2} + k\pi\right\}$

C) $\left\{x \mid x = \frac{\pi}{8} + \frac{2k\pi}{4} \vee x = \frac{\pi}{3} + 2k\pi\right\}$

D) $\left\{x \mid x = \frac{\pi}{12} + \frac{2k\pi}{5} \vee x = \frac{2\pi}{3} + 2k\pi\right\}$

E) $\left\{x \mid x = \frac{\pi}{18} + \frac{2k\pi}{3} \vee x = \frac{5\pi}{6} + 2k\pi\right\}$

11. $x \in [0, \pi]$,

$\cos 2x - 3\sin x + 1 = 0 \Rightarrow \boldsymbol{\sum x = ?}$

A) $\frac{\pi}{3}$

B) $\frac{\pi}{6}$

C) $\frac{\pi}{2}$

D) $\frac{5\pi}{6}$

E) π

12. $x \in [0, \pi)$,

$\sin\left(x + \frac{\pi}{3}\right) = \sin\left(2x - \frac{\pi}{3}\right) \Rightarrow \boldsymbol{\sum x = ?}$

A) $\frac{4\pi}{3}$ B) $\frac{3\pi}{2}$ C) $\frac{7\pi}{4}$

D) $\frac{11\pi}{3}$ E) π

YANITLAR / ANSWERS

1. B	**2. A**	**3. E**	**4. C**	**5. B**	**6. D**	**7. E**	**8. E**
9. A	**10. E**	**11. E**	**12. E**				

1. $x^2 + 9 = 0 \Rightarrow$ **ÇK(SS) = ?**

A) $\{-i, i\}$
B) $\{-2i, 2i\}$
C) $\{-3i, 3i\}$
D) $\{-4i, 4i\}$
E) $\{2i, 3i\}$

2. $P(x) = 3x^{50} - 2x^{47} + x^{36} \Rightarrow$ **P(i) = ?**

A) $2 + i$
B) $1 + i$
C) $-1 + i$
D) $-2 + 2i$
E) $-3 + 3i$

3. $(z - i)\cdot(1 + i) = 4 + 6i \Rightarrow$ **z = ?**

A) $4 + i$
B) $5 + 2i$
C) $3 + 4i$
D) $2 - i$
E) $4 - 3i$

4. $z + \dfrac{1-i}{3+2i} = 4 + i \Rightarrow$ **Re(z) = ?**

A) $\frac{41}{13}$
B) $\frac{47}{13}$
C) $\frac{51}{13}$
D) $\frac{53}{13}$
E) $\frac{55}{13}$

5. $z = -2 + 2\sqrt{3}i \Rightarrow$ **$z = r\cdot cis\theta = ?$**

A) $4cis\frac{\pi}{6}$
B) $4cis\frac{\pi}{3}$
C) $4cis\frac{\pi}{2}$
D) $4cis\frac{2\pi}{3}$
E) $4cis\frac{5\pi}{6}$

6. $z = 3cis\,\dfrac{5\pi}{6} \Rightarrow$ **Re(z) = ?**

A) $-\frac{3}{2}$
B) $\frac{3}{2}$
C) $-\frac{3\sqrt{3}}{2}$
D) $\frac{3\sqrt{3}}{2}$
E) 3

7. $z_1 = 18\text{cis } 230°$

$z_2 = 3\text{cis } 50° \Rightarrow \textbf{Re}\left(\frac{z_1}{z_2}\right) = ?$

A) –6

B) –3

C) 2

D) 3

E) 6

8. $z = \sqrt{2}\text{ cis}18° \Rightarrow \textbf{Re}(z^{10}) = ?$

A) –2

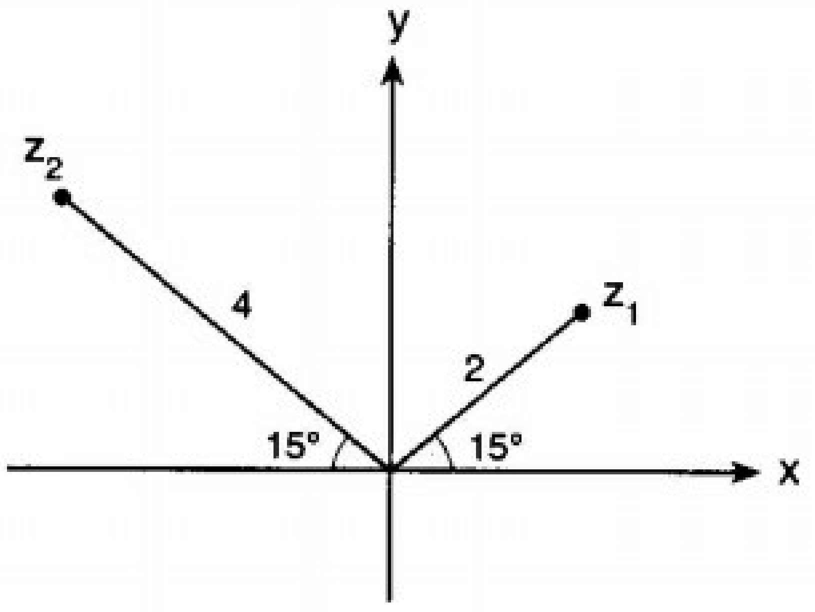
B) –4

C) –8

D) –16

E) –32

9. $\textbf{Re}\left(\frac{z_2}{z_1}\right) = ?$



A) $-\sqrt{3}$

B) –1

C) 1

D) $\sqrt{3}$

E) 2

10. $z_1 = 2 - 2i$

$z_2 = 3 + 3\sqrt{3}i \Rightarrow \textbf{Arg}\left(\frac{z_1}{z_2^2}\right) = ?$

A) 180°

B) 185°

C) 190°

D) 195°

E) 200°

11. $z = \frac{1}{2-3i} \Rightarrow \textbf{im}(z^2) = ?$

A) $\frac{12}{169}$

B) $\frac{3}{13}$

C) $\frac{5}{169}$

D) $-\frac{5}{169}$

E) $-\frac{12}{169}$

12. $z = -1 + \sqrt{3}i \Rightarrow w_1 = ?$

A) $\frac{\sqrt{2}}{2} + \frac{\sqrt{6}}{2}i$

B) $\frac{\sqrt{3}}{3} + \frac{\sqrt{6}}{2}i$

C) $\frac{\sqrt{3}}{3} + \frac{\sqrt{7}}{2}i$

D) $\sqrt{3} + \frac{\sqrt{6}}{2}i$

E) $1 + \frac{\sqrt{6}}{2}i$

YANITLAR / ANSWERS

1. C	2. D	3. B	4. C	5. D	6. C	7. A	8. E
9. A	10. D	11. A	12. A				

1. $x^2 + 9 = 0$

$x^2 = -9$

$x = \mp\sqrt{-9}$

$x = \mp 3i$

Yanıt / The Answer is C

---

2. $P(i) = 3i^{50} - 2i^{47} + i^{36}$

$= 3i^2 - 2i^3 + i^0$

$= -3 + 2i + 1$

$= -2 + 2i$

Yanıt / The Answer is D

---

3. $(z - i)(1 + i) = 4 + 6i$

$z = a + bi \Rightarrow (a + bi - i)(1 + i) = 4 + 6i$

$a + ai + bi - b - i + 1 = 4 + 6i$

$(a - b + 1) + (a + b - 1)i = 4 + 6i$

$a - b + 1 = 4 \Rightarrow a - b = 3$

$a + b - 1 = 6 \Rightarrow +\ a + b = 7$

$2a = 10$

$a = 5 \Rightarrow a - b = 3$

$5 - b = 3$

$5 - 3 = b$

$2 = b$

$\Rightarrow z = 5 + 2i$

Yanıt / The Answer is B

4.
$$z + \frac{1-i}{3+2i} = 4 + i$$

$$z = 4 + i - \frac{1-i}{3+2i}$$

$$= \frac{12 + 8i + 3i - 2 - 1 + i}{3+2i}$$

$$= \frac{9+12i}{3+2i}$$

$$= \frac{(9+12i)(3-2i)}{13} = \frac{51 - 18i + 36i}{13}$$

$$= \frac{51}{13} + \frac{18}{13}i \Rightarrow \text{Re}(z) = \frac{51}{13}$$

Yanıt / The Answer is C

---

5. $\tan\theta = \dfrac{2\sqrt{3}}{-2} = -\sqrt{3} \Rightarrow \theta = \pi - \dfrac{\pi}{3} = \dfrac{2\pi}{3}$

$|z| = \sqrt{(-2)^2 + (2\sqrt{3})^2} = 4$

$\Rightarrow z = 4\text{cis}\dfrac{2\pi}{3}$

Yanıt / The Answer is D

---

6. $z = 3\text{cis}\dfrac{5\pi}{6}$

$$= 3\left[\cos\frac{5\pi}{6} + i\sin\frac{5\pi}{6}\right]$$

$$= 3\left[-\frac{\sqrt{3}}{2} + i\frac{1}{2}\right]$$

$$= \frac{-3\sqrt{3}}{2} + \frac{3}{2}i$$

$$\Rightarrow \text{Re}(z) = \frac{-3\sqrt{3}}{2}$$

Yanıt / The Answer is C

7. $$\frac{z_1}{z_2} = \frac{18}{3}\operatorname{cis}(230° - 50°)$$

$$= 6(\cos 180° + i\sin 180°)$$

$$= -6$$

$$\Rightarrow \operatorname{Re}\left(\frac{z_1}{z_2}\right) = -6$$

Yanıt / The Answer is A

8. $$z = \sqrt{2}\operatorname{cis}18° \Rightarrow z^{10} = (\sqrt{2})^{10}\operatorname{cis}(18° \cdot 10)$$

$$= 32\operatorname{cis}180°$$

$$\Rightarrow \operatorname{Re}(z) = 32\cos 180° = -32$$

Yanıt / The Answer is E

9. $$z_1 = 2\operatorname{cis}15°$$

$$z_2 = 4\operatorname{cis}(180° - 15°) = 4\operatorname{cis}165°$$

$$\frac{z_2}{z_1} = \frac{4}{2}\operatorname{cis}(165° - 15°) = 2\operatorname{cis}150°$$

$$\operatorname{Re}\left(\frac{z_2}{z_1}\right) = 2\cos 150° = 2 \cdot \left(\frac{-\sqrt{3}}{2}\right) = -\sqrt{3}$$

Yanıt / The Answer is A

10. $$z_1 = 2 - 2i \Rightarrow \tan\theta_1 = \frac{-2}{2} = -1$$

$$\theta_1 = 360° - 45° = 315°$$

$$z_2 = 3 + 3\sqrt{3}\,i \Rightarrow \tan\theta_2 = \frac{3\sqrt{3}}{3} = \sqrt{3}$$

$$\Rightarrow \theta_2 = 60°$$

$$\operatorname{Arg}\left(\frac{z_1}{z_2^2}\right) = 315° - 2 \cdot 60° = 195°$$

Yanıt / The Answer is D

11. $$z = \underset{(2+3i)}{\frac{1}{2-3i}} = \frac{2+3i}{13}$$

$$z^2 = \frac{(2+3i)^2}{169} = \frac{4 + 12i - 9}{169}$$

$$\Rightarrow \operatorname{Im}(z) = \frac{12}{169}$$

Yanıt / The Answer is A

12. $$z = -1 + \sqrt{3}i \Rightarrow a = -1,\ b = \sqrt{3},\ |z| = 2$$

$$w_{0,1} = \pm\left(\sqrt{\frac{2-1}{2}} \pm \sqrt{\frac{2+1}{2}}\,i\right)$$

$$= \pm\left(\frac{\sqrt{2}}{2} \pm \frac{\sqrt{6}}{2}i\right)$$

Yanıt / The Answer is A

1. $A = \sqrt{-169} + \sqrt{-16}$

$B = \sqrt{-25} - \sqrt{-36}$

$\Rightarrow$ **A·B = ?**

A) –17

B) 17i

C) 17

D) –17i

E) 15i

2. **$i^{1987} + i^{1985} = ?$**

A) –i

B) –1

C) 0

D) 1

E) i

3. $z = \dfrac{1+i}{1-i} \Rightarrow$ **Re(z) = ?**

A) –1

B) 0

C) 1

D) 2

E) 3

4. $x > y$,

$z = (x - y)^2 + 6i$,

$w = 16 + (x + y)i$,

$z = w \Rightarrow$ **x·y = ?**

A) –1

B) 1

C) 2

D) 3

E) 5

5. $z_1 = x + 2i$,

$z_2 = y - (3 + x)\, i$,

$z_1 + z_2 = 6 + 12i$

$\Rightarrow$ **x – y = ?**

A) –12

B) –16

C) –24

D) –32

E) –36

6. $z + \bar{z} \cdot 2 = 9 - 8i \Rightarrow$ **|z| = ?**

A) $\sqrt{65}$

B) $\sqrt{67}$

C) $\sqrt{69}$

D) $\sqrt{71}$

E) $\sqrt{73}$

7. $z_1 = 4 - 3i$

$z_2 = 1 - xi,$

$|z_1 - z_2| = 5$

$\Rightarrow \boldsymbol{\sum x = ?}$

A) -1

B) 1

C) 3

D) 6

E) 8

8. $z = 2 - 2\sqrt{3}i \Rightarrow \mathbf{z = r\,cis\theta = ?}$

A) $4\,cis\frac{5\pi}{6}$

B) $2\,cis\frac{\pi}{6}$

C) $4\,cis\frac{5\pi}{3}$

D) $2\,cis\frac{5\pi}{6}$

E) $4\,cis\frac{\pi}{6}$

9. $z = -2 - 2i \Rightarrow \mathbf{z^{16} = ?}$

A) 2^{24}

B) -2^{24}

C) $2^{24}i$

D) $-2^{24}i$

E) 0

10. $z_1 = -2 + 2i$

$z_2 = 3 - \sqrt{3}i$

$\Rightarrow \mathbf{z_1 \cdot z_2 = ?}$

A) $4\sqrt{6}\,cis\frac{\pi}{12}$

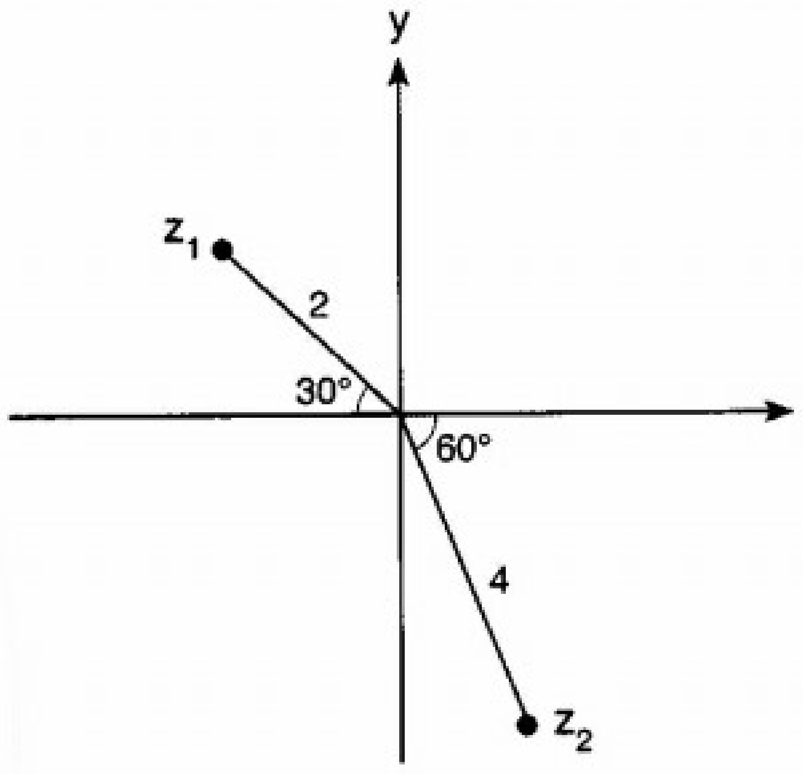
B) $4\sqrt{3}\,cis\frac{7\pi}{12}$

C) $4\sqrt{6}\,cis\frac{7\pi}{12}$

D) $4\sqrt{6}\,cis\frac{7\pi}{6}$

E) $2\sqrt{6}\,cis\frac{7\pi}{12}$

11. $\mathbf{Re\left(\frac{z_2}{z_1}\right) = ?}$



A) $\sqrt{3}$

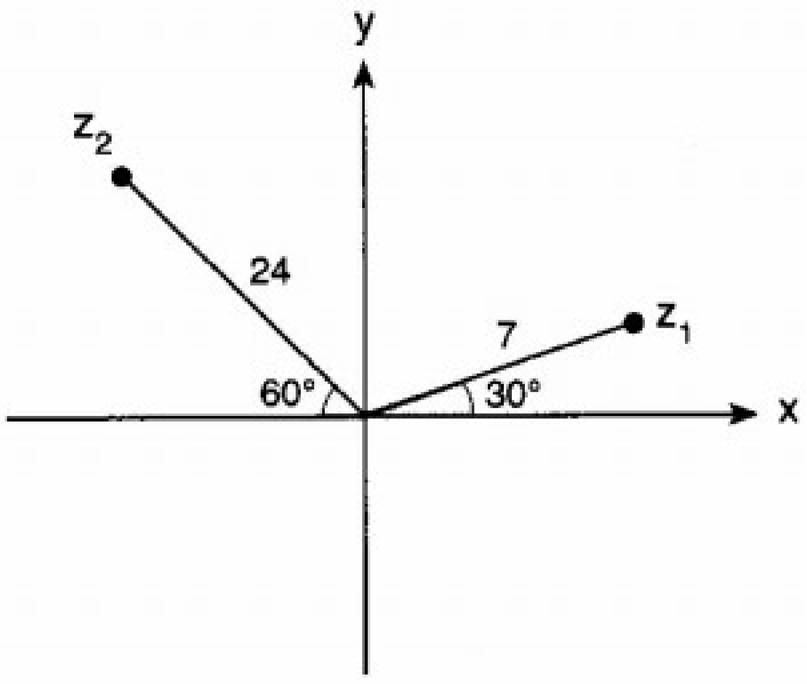
B) $-\sqrt{3}$

C) $2\sqrt{3}$

D) $-2\sqrt{3}$

E) $4\sqrt{3}$

12. $\mathbf{|z_1 - z_2| = ?}$



A) 12

B) 15

C) 25

D) 33

E) 36

YANITLAR / ANSWERS

1. C	2. C	3. B	4. E	5. D	6. E	7. D	8. C
9. A	10. C	11. B	12. C				

1. $A = 13i + 4i = 17i$

$B = 5i - 6i = -i$

$\Rightarrow A \cdot B = -17i^2 = 17$

Yanıt / The Answer is C

2. $\begin{array}{r|l} 1987 & 4 \\ \hline \text{❸} & \end{array} \qquad \begin{array}{r|l} 1985 & 4 \\ \hline \text{❶} & \end{array}$

$i^{1987} + i^{1985} = i^3 + i = -i + i = 0$

Yanıt / The Answer is C

3. $z = \dfrac{1+i}{\underset{(1+i)}{1-i}} = \dfrac{2i}{1-i^2} = \dfrac{2i}{2} = i$

$\Rightarrow \mathrm{Re}(z) = 0$

Yanıt / The Answer is B

4. $(x-y)^2 = 16 \Rightarrow x - y = 4$

$$\begin{array}{r} x - y = 4 \\ + \; x + y = 6 \\ \hline 2x = 10 \\ x = 5 \\ y = 1 \end{array}$$

$\Rightarrow x \cdot y = 5 \cdot 1 = 5$

Yanıt / The Answer is E

5. $z_1 + z_2 = x + y + (2 - 3 - x)\,i = 6 + 12i$

$\Rightarrow x + y = 6$

$-1 - x = 12$

$x = -13 \Rightarrow y = 19$

$x - y = -13 - 19 = -32$

Yanıt / The Answer is D

6. $z = a + bi \Rightarrow \bar{z} = a - bi$

$a + bi + 2(a - bi) = 9 - 8i$

$3a - bi = 9 - 8i$

$\Rightarrow 3a = 9 \quad , \quad -b = -8$

$a = 3 \quad , \quad b = 8$

$|z| = \sqrt{a^2 + b^2} = \sqrt{3^2 + 8^2} = \sqrt{73}$

Yanıt / The Answer is E

7. $z_1 - z_2 = 3 - (3 - x)i \Rightarrow |z_1 - z_2| = \sqrt{3^2 + (3 - x)^2} = 5$

$$9 + (3 - x)^2 = 25$$

$$(3 - x)^2 = 4^2 \Rightarrow 3 - x = 4 \quad , \quad 3 - x = -4$$

$$x = -1 \quad , \quad x = 7$$

$$\Rightarrow \sum x = -1 + 7 = 6$$

Yanıt / The Answer is D

8. $|z| = r = \sqrt{2^2 + (2\sqrt{3})^2} = 4$

$$\tan\theta = \frac{-2\sqrt{3}}{2} = -\sqrt{3} \Rightarrow \theta = 2\pi - \frac{\pi}{3} = \frac{5\pi}{3}$$

$$\Rightarrow z = 4\,\text{cis}\,\frac{5\pi}{3}$$

Yanıt / The Answer is C

9. $|z| = \sqrt{4 + 4} = \sqrt{8}$

$$\tan\theta = \frac{-2}{-2} = 1 \Rightarrow \theta = \pi + \frac{\pi}{4} = \frac{5\pi}{4}$$

$$z = \sqrt{8}\,\text{cis}\,\frac{5\pi}{4} \Rightarrow z^{16} = (\sqrt{8})^{16}\,\text{cis}\left(\frac{5\pi}{4}\cdot 16\right)$$

$$= 2^{24}\,\text{cis}\,20\pi$$

$$= 2^{24}\,\text{cis}0° = 2^{24}$$

Yanıt / The Answer is A

10. z_1: $|z_1| = \sqrt{2^2 + 2^2} = \sqrt{8}$

$$\tan\theta_1 = \frac{2}{-2} = -1 \Rightarrow \theta_1 = \pi - \frac{\pi}{4} = \frac{3\pi}{4}$$

$$z_1 = 2\sqrt{2}\,\text{cis}\,\frac{3\pi}{4}$$

z_2: $|z_2| = \sqrt{3^2 + (\sqrt{3})^2} = 2\sqrt{3}$

$$\tan\theta_2 = \frac{-\sqrt{3}}{3} = \frac{-1}{\sqrt{3}} \Rightarrow \theta_2 = 2\pi - \frac{\pi}{6} = \frac{11\pi}{6}$$

$$z_2 = 2\sqrt{3}\,\text{cis}\,\frac{11\pi}{6}$$

$$z_1 \cdot z_2 = 2\sqrt{2}\cdot 2\sqrt{3}\cdot\text{cis}\left(\frac{3\pi}{4} + \frac{11\pi}{6}\right)$$

$$= 4\sqrt{6}\,\text{cis}\,\frac{31\pi}{12} = 4\sqrt{6}\,\text{cis}\,\frac{7\pi}{12}$$

Yanıt / The Answer is C

11. $z_1 = 2\text{cis}(180° - 30°) = 2\text{cis}150°$

$z_2 = 4\text{cis}(360° - 60°) = 4\text{cis}300°$

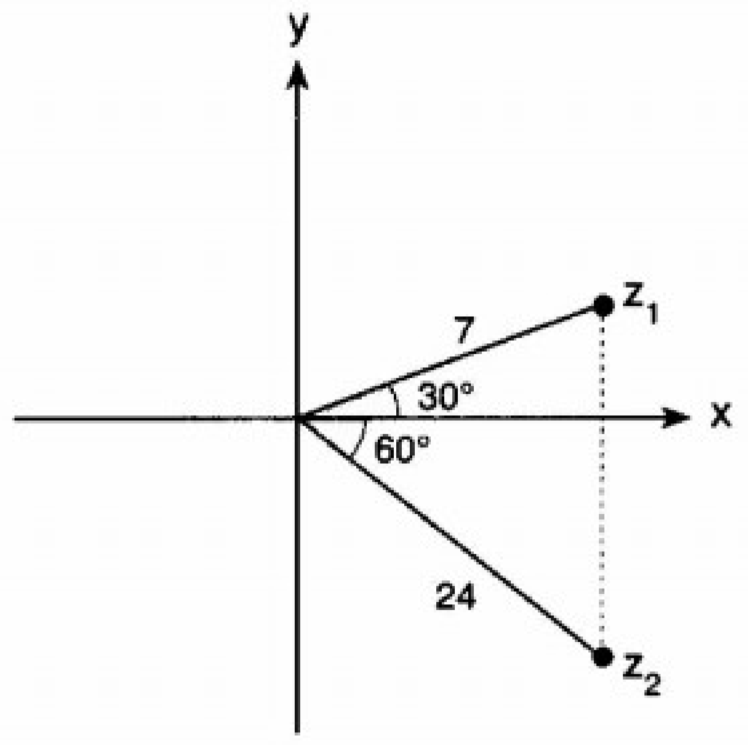
$$\frac{z_2}{z_1} = \frac{4}{2}\text{cis}(300° - 150°) = 2\,\text{cis}\,150°$$

$$\Rightarrow \text{Re}\left(\frac{z_2}{z_1}\right) = 2\cos 150° = 2\cdot\frac{-\sqrt{3}}{2} = -\sqrt{3}$$

Yanıt / The Answer is B

12. $|z_1 - z_2|^2 = 7^2 + 24^2$

$\Rightarrow |z_1 - z_2| = 25$



Yanıt / The Answer is C

1. $\dfrac{\sqrt{-16}+\sqrt{-4}}{\sqrt{-9}} = ?$

Yanıt / The Answer is: **2**

2. $P(x) = x^{121} + 2x^{98} - x^{72} \Rightarrow \mathbf{P(i) = ?}$

Yanıt / The Answer is: **$i - 3$**

3. $z = -3 + \sqrt{7}i \Rightarrow \mathbf{|z| = ?}$

Yanıt / The Answer is: **4**

4. $z + 4i = iz - 8 \Rightarrow \mathbf{z = ?}$

Yanıt / The Answer is: **$-6i - 2$**

5. $z = \dfrac{1}{4+i} - \dfrac{1}{4-i} \Rightarrow \mathbf{Re(z) = ?}$

Yanıt / The Answer is: **0**

6. $z = -3 + 3i \Rightarrow \mathbf{z = r \cdot cis\theta = ?}$

Yanıt / The Answer is: **$3\sqrt{2}\ \text{cis}\ \dfrac{3\pi}{4}$**

7. $z = 1 + \sqrt{3}i \Rightarrow \mathbf{z = r \cdot cis\theta = ?}$

Yanıt / The Answer is: $\mathbf{2\,cis\,\frac{\pi}{3}}$

8. $z = 12\ cis\ \frac{\pi}{2} \Rightarrow \mathbf{Im(z) = ?}$

Yanıt / The Answer is: **12**

9. $z = 2 - 2i \Rightarrow \mathbf{z = r \cdot cis\alpha = ?}$

Yanıt / The Answer is: $\mathbf{2\sqrt{2}\ cis\ \frac{7\pi}{4}}$

10. $\left.\begin{array}{l} z_1 = 3 - 2i \\ z_2 = -3 - 10i \end{array}\right\} \Rightarrow \mathbf{|z_1 - z_2| = ?}$

Yanıt / The Answer is: **10**

11. $z = -8i \Rightarrow \mathbf{z = r \cdot cis\theta = ?}$

Yanıt / The Answer is: $\mathbf{8\,cis\,\frac{3\pi}{2}}$

12. $z = 3\sqrt{2} + 3\sqrt{6}i \Rightarrow \mathbf{z = r \cdot cis\theta = ?}$

Yanıt / The Answer is: $\mathbf{6\sqrt{2}\ cis\ \frac{\pi}{3}}$

1. $x^2 + mx + n = 0$,

ÇK(SS) = $\{2 \pm 5i\}$ ⇒ **$m + n = ?$**

A) 21

B) 24

C) 25

D) 27

E) 30

2. $P(x) = 3x^{21} + x^{16} - 2x^{11}$ ⇒ **$P(i) = ?$**

A) $1 + 3i$

B) $1 + 5i$

C) $2 + 3i$

D) $4 - i$

E) $5 + 3i$

3. $(1 - i)\cdot z + i\bar{z} = 5 + i$ ⇒ **$|z| = ?$**

A) $2\sqrt{5}$

B) $\sqrt{10}$

C) $3\sqrt{2}$

D) $5\sqrt{3}$

E) $2\sqrt{15}$

4. $z = (1 - i)^{22} + (1 + i)^{22}$ ⇒ **$z = ?$**

A) -2^{11}

B) $-2^{11}i$

C) 0

D) 2^{11}

E) $2^{11}i$

5. $z = x + yi$,

$3z + 5 = \bar{z} + 13 - 4i$ ⇒ **$x + y = ?$**

A) –5

B) –3

C) –2

D) 1

E) 3

6. $z = x + yi$,

$(z - 1)\cdot(3 + i) = 3 + 11i$ ⇒ **$x + y = ?$**

A) –8

B) –3

C) 2

D) 6

E) 7

7. $z=\dfrac{(2-i)^2\cdot(4+2i)}{3+4i} \Rightarrow$ **$|z|=?$**

A) $2\sqrt{5}$

B) $3\sqrt{5}$

C) $4\sqrt{5}$

D) $5\sqrt{5}$

E) $6\sqrt{5}$

8. $z = x + yi,$

$z\cdot(1-i)=\bar{z}+1-i \Rightarrow$ **$x + y = ?$**

A) 2

B) 3

C) 4

D) 5

E) 6

9. $z=\dfrac{3+2i}{4-i} \Rightarrow$ **$\mathrm{Im}(z) = ?$**

A) $\dfrac{7}{17}$

B) $\dfrac{11}{17}$

C) $\dfrac{12}{17}$

D) $\dfrac{18}{17}$

E) $\dfrac{24}{17}$

10. $\left.\begin{array}{l} z_1 = 2 - i \\ z_2 = 4 + 9i \end{array}\right\} \Rightarrow$ **$|z_1 + z_2| = ?$**

A) 4

B) 5

C) 7

D) 8

E) 10

11. $z = -6 + 6i$

$z = r\mathrm{cis}\theta \quad \Rightarrow \quad$ **$\theta = ?$**

A) $\dfrac{3\pi}{4}$

B) $\dfrac{5\pi}{4}$

C) $\dfrac{3\pi}{2}$

D) $\dfrac{7\pi}{4}$

E) $\dfrac{11\pi}{6}$

12. $z = x + yi$

$2z + 3 - 7i = \bar{z} + 8 - 4i \Rightarrow$ **$x + y = ?$**

A) –1

B) 2

C) 3

D) 5

E) 6

YANITLAR / ANSWERS

1. C	**2. B**	**3. B**	**4. C**	**5. E**	**6. D**	**7. A**	**8. C**
9. B	**10. E**	**11. A**	**12. E**				

1. $\dfrac{i^{55}-4\cdot i^{37}+3\cdot i^{72}}{2+i^{131}}=?$

A) $\frac{2}{5}-\frac{11}{5}i$

B) $\frac{3}{5}+\frac{13}{5}i$

C) $\frac{11}{5}-\frac{7}{5}i$

D) $\frac{1}{7}-\frac{11}{7}i$

E) $\frac{3}{10}-\frac{17}{10}i$

2. $z = x + yi$,

$z=\dfrac{2+i}{1-i}+\dfrac{4-i}{2+i} \Rightarrow$ **Re(z) = ?**

A) $\frac{17}{10}$

B) $\frac{19}{10}$

C) $\frac{21}{10}$

D) $\frac{23}{10}$

E) $\frac{27}{10}$

3. $z=\dfrac{1}{1+i}-\dfrac{1}{1-i} \Rightarrow$ **$|z|$ = ?**

A) 1

B) 0

C) $\sqrt{2}$

D) $\sqrt{3}$

E) 2

4. $-|5i\cdot z|+|4\bar{z}|+|3i\cdot\bar{z}|=8 \Rightarrow$ **$|z|$ = ?**

A) 1

B) 2

C) 3

D) 4

E) 5

5. $z_1 = 5-3i$

$z_2 = 4+2i \Rightarrow$ **$|z_1-z_2|$ = ?**

A) $\sqrt{17}$

B) $\sqrt{26}$

C) $\sqrt{37}$

D) $\sqrt{47}$

E) $\sqrt{65}$

6. $x \in R^+$,

$z=\dfrac{(2-i)\cdot(x+4i)}{3-4i}$,

$|z| = 2 \Rightarrow$ **x = ?**

A) $\frac{7}{2}$

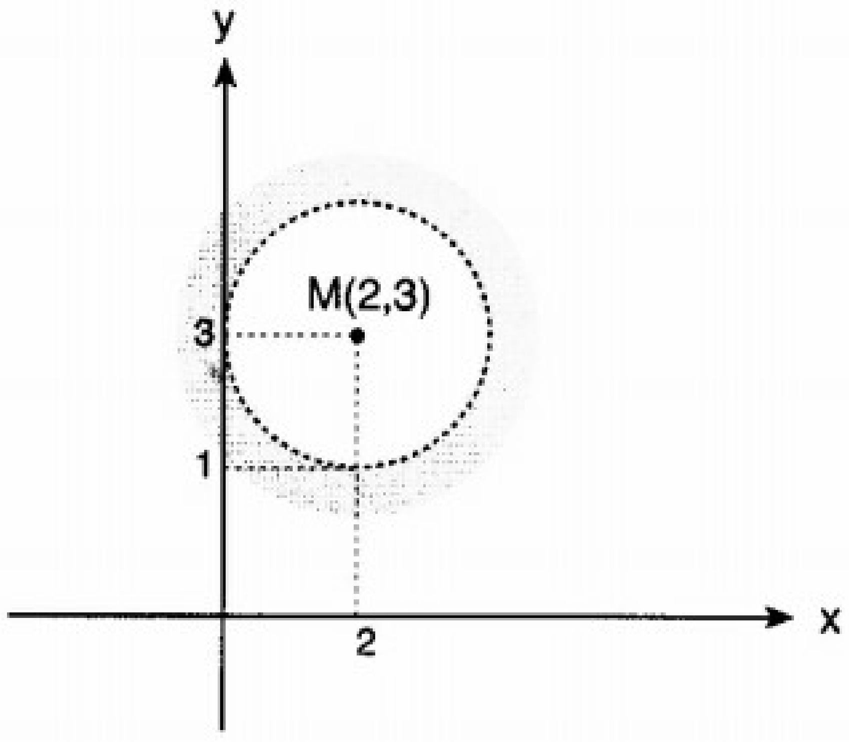
B) 3

C) $\frac{5}{2}$

D) 2

E) $\frac{3}{2}$

7.



Taralı bölge / The shaded region = ?

A) $|z-(2+3i)| \le 2$

B) $|z-2-3i| \ge 2$

C) $|z+2-3i| > 2$

D) $|z-2-3i| > 2$

E) $|z-2-3i| < 2$

8. $|z| + z = 2 + \frac{i}{2} \Rightarrow$ **Re(z) = ?**

A) $-\frac{15}{16}$

B) 1

C) $\frac{15}{16}$

D) 0

E) –1

9. $z = x + yi$,

$z\cdot(3-i) + 2 + 5i = -1 + 16i \Rightarrow$ **x + y = ?**

A) 1

B) 2

C) 3

D) 4

E) 5

10. $w^2 = -1 - \sqrt{3}i \Rightarrow$ **ÇK(SS) = ?**

A) $\left\{\sqrt{2}\,\text{cis}\frac{2\pi}{3},\ \sqrt{2}\,\text{cis}\frac{5\pi}{3}\right\}$

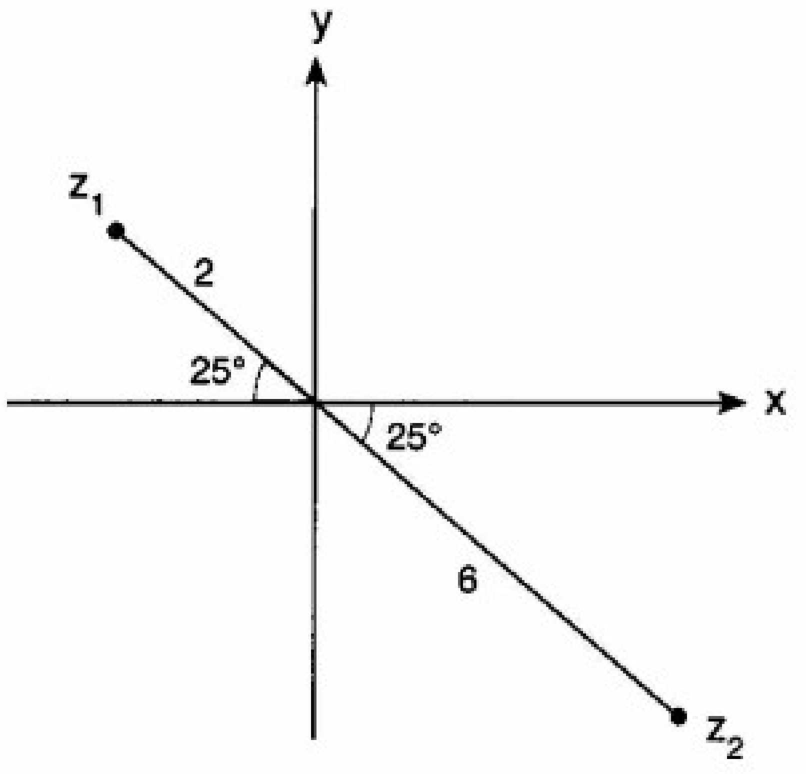
B) $\left\{\sqrt{2}\,\text{cis}\frac{5\pi}{6},\ \sqrt{2}\,\text{cis}\frac{11\pi}{6}\right\}$

C) $\left\{\sqrt{2}\,\text{cis}\frac{\pi}{3},\ \sqrt{2}\,\text{cis}\frac{7\pi}{3}\right\}$

D) $\left\{\sqrt{2}\,\text{cis}\frac{\pi}{6},\ \sqrt{2}\,\text{cis}\frac{4\pi}{3}\right\}$

E) $\left\{\sqrt{2}\,\text{cis}\frac{\pi}{4},\ \sqrt{2}\,\text{cis}\frac{3\pi}{4}\right\}$

11. $\text{Im}\left(\frac{z_2}{z_1}\right) = ?$



A) 1

B) 0

C) –1

D) –2

E) –3

12. $z_1 = 2 - 2\sqrt{3}i$

$z_2 = -1 + i \Rightarrow \text{Arg}\left(\frac{z_1^3}{z_2}\right) = ?$

A) $\frac{\pi}{15}$

B) $\frac{\pi}{12}$

C) $\frac{\pi}{4}$

D) $\frac{\pi}{3}$

E) $\frac{\pi}{2}$

YANITLAR / ANSWERS

1. C	2. B	3. A	4. D	5. B	6. D	7. D	8. C
9. A	10. A	11. B	12. C				

1. $\log_{0,01}100000 = x \Rightarrow$ **$x = ?$**

A) -1

B) $-\frac{3}{2}$

C) -2

D) $-\frac{5}{2}$

E) -3

2. $3\log_2 x = 6 \Rightarrow$ **$x = ?$**

A) 2

B) 4

C) 6

D) 8

E) 12

3. $f(x) = 3 + \log_3(x-2) \Rightarrow$ **$f(11) = ?$**

A) 6

B) 5

C) 4

D) 3

E) 2

4. $f(x) = \log_3(2x-3)$,

$g(x) = 5^x \Rightarrow$ **$fog^{-1}(25) = ?$**

A) -1

B) 0

C) 1

D) 2

E) 3

5. $5 = 3^a$ ve(and) $2 = 3^b \Rightarrow$ **$\log_3 500 = ?$**

A) $a + b$

B) $2a + 2b$

C) $2a + 3b$

D) $3a + 2b$

E) $3a + 3b$

6. $$\left.\begin{array}{l} x = \log_3 11 \\ y = \log_5 7 \\ z = \log_2 18 \end{array}\right\} \Rightarrow \; ? < ? < ?$$

A) $x < y < z$

B) $z < y < x$

C) $y < z < x$

D) $y < x < z$

E) $x < z < y$

7. $\log_2 3 = a$ ve (and) $\log_2 5 = b \Rightarrow$ **$\log_6 15 = ?$**

A) $\dfrac{2a+b}{1+2a}$

B) $\dfrac{a+b}{1+a}$

C) $\dfrac{a+2b}{3+a}$

D) $\dfrac{a+b}{2+a}$

E) $\dfrac{3a+b}{3+a}$

8. $3^{\log_x 5} + 5^{\log_x 3} = 18 \Rightarrow$ **$x = ?$**

A) $\sqrt{3}$

B) $\sqrt{5}$

C) $\sqrt{6}$

D) $\sqrt{7}$

E) $\sqrt{10}$

9. $\log 5 = a \Rightarrow$ **$\log 4 = ?$**

A) $1 - a$

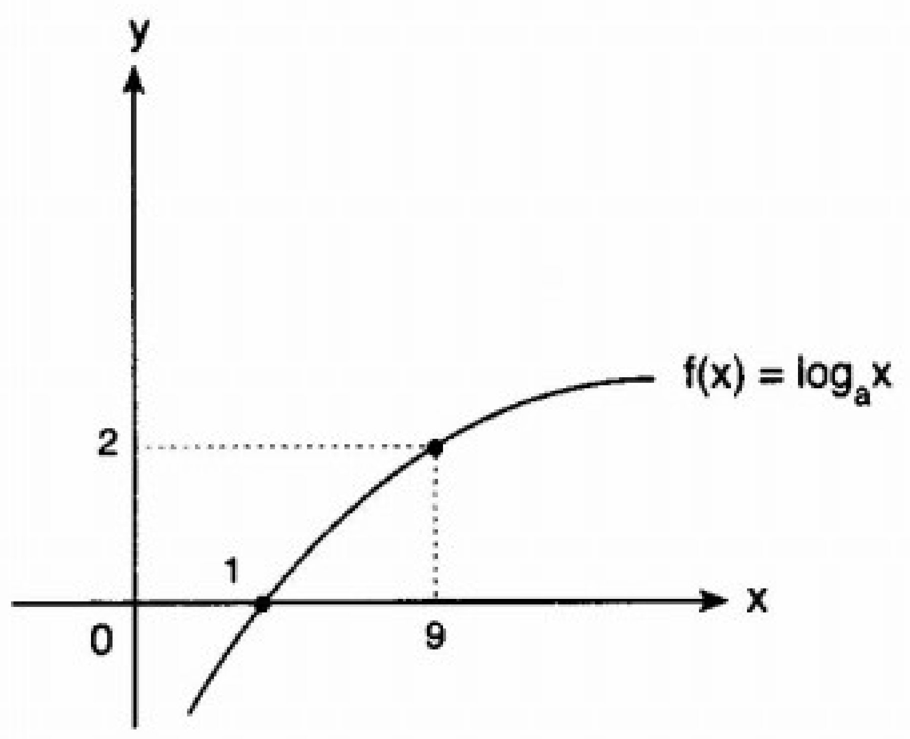
B) $2 - 2a$

C) $3 - 3a$

D) $2 + a$

E) $1 + 2a$

10. $f\left(\dfrac{1}{3}\right) = ?$



A) -1

B) $-\dfrac{1}{2}$

C) 0

D) $\dfrac{1}{2}$

E) 3

11. $x \in Z$,

$\log_3(2x-3) < 2 \Rightarrow$ **$\sum x = ?$**

A) 12

B) 14

C) 15

D) 21

E) 22

12. $x^{\ln x} - e^{12} \cdot x = 0 \Rightarrow$ **ÇK(SS) = ?**

A) $\{e, e^3\}$

B) $\left\{\dfrac{1}{e^3}, e^4\right\}$

C) $\{1, e^4\}$

D) $\left\{1, \dfrac{1}{e^3}, e^4\right\}$

E) $\{e^4\}$

YANITLAR / ANSWERS							
1. D	2. B	3. B	4. B	5. D	6. D	7. B	8. B
9. B	10. A	11. B	12. B				

1. $\log_{0,01} 100000 = x$

$\log_{10^{-2}} 10^5 = x$

$-\frac{5}{2} = x$

Yanıt / The Answer is D

2. $3 \cdot \log_2 x = 6$

$\log_2 x = 2$

$x = 4$

Yanıt / The Answer is B

3. $f(x) = 3 + \log_3 (x - 2)$

$\Rightarrow f(11) = 3 + \log_3 9$

$= 3 + 2$

$= 5$

Yanıt / The Answer is B

4. $g(x) = 5^x \Rightarrow x = \log_5 y$

$g^{-1}(x) = \log_5 y$

$fog^{-1}(25) = f(\log_5 25)$

$= f(2)$

$= \log_3 (2 \cdot 2 - 3) = 0$

Yanıt / The Answer is B

5. $3^a = 5 \Rightarrow a = \log_3 5$

$3^b = 2 \Rightarrow b = \log_3 2$

$\log_3 500 = \log_3 (5^3 \cdot 2^2)$

$= 3 \log_3 5 + 2\log_3 2$

$= 3a + 2b$

Yanıt / The Answer is D

6.
$$\left.\begin{array}{l} x = \log_3 11 \Rightarrow 3^x = 11 \Rightarrow 2 < x < 3 \\ y = \log_5 7 \Rightarrow 5^y = 7 \Rightarrow 1 < y < 2 \\ z = \log_2 18 \Rightarrow 2^z = 18 \Rightarrow 4 < z < 5 \end{array}\right\} \Rightarrow y < x < z$$

Yanıt / The Answer is D

7. $\log_6 15 = \dfrac{\log_2 15}{\log_2 6}$

$$= \frac{\log_2 3 + \log_2 5}{\log_2 3 + \log_2 2}$$

$$= \frac{a+b}{a+1}$$

Yanıt / The Answer is B

8. $3^{\log_x 5} + 5^{\log_x 3} = 18$

$$3^{\log_x 5} + 3^{\log_x 5} = 18$$

$$3^{\log_x 5} = 9$$

$$\log_x 5 = 2$$

$$x^2 = 5$$

$$x = \sqrt{5}$$

Yanıt / The Answer is B

9. $\log 4 = 2\log 2$

$$= 2\,[\log 10 - \log 5]$$

$$= 2\,[1 - a]$$

$$= 2 - 2a$$

Yanıt / The Answer is B

10. $x = 9 \Rightarrow y = 2$

$$f(x) = \log_a x \Rightarrow f(9) = \log_a 9 = 2$$

$$a^2 = 9$$

$$a = 3$$

$$f(x) = \log_3 x \Rightarrow f\left(\frac{1}{3}\right) = \log_3 \frac{1}{3}$$

$$= \log_3 3^{-1}$$

$$= -1$$

Yanıt / The Answer is A

11. $\log_3 (2x - 3) < 2$

$$2x - 3 < 9$$

$$2x < 12$$

$$x < 6$$

$$2x - 3 > 0 \Rightarrow x > \frac{3}{2}$$

$$\frac{3}{2} < x < 6 \Rightarrow \sum x = 2 + 3 + 4 + 5 = 14$$

Yanıt / The Answer is B

12. $x^{\ln x} - e^{12}x = 0$

$$x^{\ln x} = e^{12}x$$

$$\ln x \cdot \ln x = \ln x + \ln e^{12}$$

$$(\ln x)^2 = \ln x + 12$$

$$(\ln x)^2 - \ln x - 12 = 0$$

$$\ln x = t \Rightarrow t^2 - t - 12 = 0$$

$$(t-4)\cdot(t+3) = 0$$

$$t = 4, \quad t = -3$$

$$\left.\begin{array}{l} \ln x = 4 \Rightarrow x = e^4 \\ \ln x = -3 \Rightarrow x = e^{-3} \end{array}\right\} \Rightarrow \text{ÇK(SS)} = \left\{e^4, \frac{1}{e^3}\right\}$$

Yanıt / The Answer is B

1. $\log_2 \frac{1}{16} + \log_3 27 = ?$

A) –5

B) –4

C) –3

D) –1

E) 0

2. $\log_5 x \cdot \log_{25} x \cdot \log_{125} x = \frac{1}{6} \Rightarrow x = ?$

A) 1

B) 2

C) 3

D) 4

E) 5

3. $9^{\log_3 x} = 8 \Rightarrow \log_2 x = ?$

A) $\frac{1}{2}$

B) 1

C) $\frac{3}{2}$

D) 2

E) $\frac{5}{2}$

4. $\log_4 9 \cdot \log_{\sqrt{3}} 125 \cdot \log_{25} 8 = ?$

A) 5

B) 6

C) 7

D) 8

E) 9

5. $\log_3 8! = a \Rightarrow \log_{27} 9! = ?$

A) $\frac{a+1}{2}$

B) $\frac{a+3}{2}$

C) $\frac{a+1}{3}$

D) $\frac{a+2}{3}$

E) $\frac{a+5}{4}$

6. $$\left.\begin{array}{l} \log_2\left(\frac{x}{y^2}\right)=0 \\ \log_2(x\cdot y)=3 \end{array}\right\} \Rightarrow x=?$$

A) 2

B) 4

C) 8

D) 16

E) 32

7. $\log_3 4 = a \Rightarrow \mathbf{\log_4 12 = ?}$

A) $\frac{2a+2}{a}$

B) $\frac{3a+1}{a}$

C) $\frac{a+1}{a}$

D) $\frac{a+3}{a+1}$

E) $\frac{a-2}{a+1}$

8. $2^{\log_x 3} + 3^{\log_x 2} = 18 \Rightarrow \mathbf{x = ?}$

A) 4

B) $\sqrt{5}$

C) $\sqrt{3}$

D) $\sqrt{2}$

E) 2

9. $\log_5 2 + \log_5 x - \log_5 4 = 1 \Rightarrow \mathbf{x = ?}$

A) $\frac{1}{5}$

B) $\frac{5}{4}$

C) $\frac{5}{2}$

D) 5

E) 10

10. $f(x) = \log_3(4x - 1) \Rightarrow \mathbf{f^{-1}(3) = ?}$

A) 5

B) 6

C) 7

D) 8

E) 9

11. $x \in Z$,

$\log_3(x + 4) < \log_9 16 \Rightarrow \mathbf{\sum x = ?}$

A) –2

B) –3

C) –4

D) –5

E) –6

12. $\log_{\frac{1}{3}}(x+5) < \log_3 \frac{1}{7} \Rightarrow$ **ÇK(SS) = ?**

A) $(-\infty, 2)$

B) $(-\infty, 3)$

C) $(2, \infty)$

D) $(3, \infty)$

E) $(4, \infty)$

YANITLAR / ANSWERS

1. D	**2. E**	**3. C**	**4. E**	**5. D**	**6. B**	**7. C**	**8. D**
9. E	**10. C**	**11. E**	**12. C**				

1. $\log_2 \frac{1}{16} + \log_3 27 = \log_2 2^{-4} + \log_3 3^3$

$= -4 + 3$

$= -1$

Yanıt / The Answer is D

---

2. $\log_5 x \cdot \frac{1}{2} \log_5 x \cdot \frac{1}{3} \log_5 x = \frac{1}{6}$

$(\log_5 x)^3 = 1$

$\log_5 x = 1$

$x = 5$

Yanıt / The Answer is E

---

3. $9^{\log_3 x} = 8 \Rightarrow \log_3 x = \log_9 8$

$= \log_{3^2} 2^3 \Rightarrow x = 2^{\frac{3}{2}}$

$\log_2 x = \log_2 2^{\frac{3}{2}} = \frac{3}{2}$

Yanıt / The Answer is C

---

4. $\log_4 9 \cdot \log_{\sqrt{3}} 125 \cdot \log_{25} 8 = \log_{2^2} 3^2 \cdot \log_{3^{\frac{1}{2}}} 5^3 \cdot \log_{5^2} 2^3$

$= \log_2 3 \cdot 6 \cdot \log_3 5 \cdot \frac{3}{2} \cdot \log_5 2$

$= 6 \cdot \frac{3}{2} \cdot \log_2 2$

$= 9$

Yanıt / The Answer is E

---

5. $\log_{27} 9! = \log_{27} 9 + \log_{27} 8!$

$= \frac{2}{3} + \frac{1}{3} \log_3 8!$

$= \frac{2}{3} + \frac{1}{3} a$

$= \frac{2+a}{3}$

Yanıt / The Answer is D

---

6. $\log_2 \left(\frac{x}{y^2} \right) = 0 \Rightarrow \log_2 x - 2\log_2 y = 0$

$\log_2 (x \cdot y) = 3 \Rightarrow \underline{2 / \log_2 x + \log_2 y = 3}$

$3\log_2 x = 6$

$\log_2 x = 2$

$x = 4$

Yanıt / The Answer is B

7. $\log_4 12 = \dfrac{\log_3 12}{\log_3 4}$

$= \dfrac{\log_3 3 + \log_3 4}{\log_3 4}$

$= \dfrac{1+a}{a}$

Yanıt / The Answer is C

8. $2^{\log_x 3} + 3^{\log_x 2} = 18$

$3^{\log_x 2} + 3^{\log_x 2} = 18$

$3^{\log_x 2} = 9$

$\log_x 2 = 2$

$x^2 = 2$

$x = \sqrt{2}$

Yanıt / The Answer is D

9. $\log_5 2 + \log_5 x - \log_5 4 = 1$

$\log_5 \dfrac{2x}{4} = 1$

$\dfrac{2x}{4} = 5$

$x = 10$

Yanıt / The Answer is E

10. $f(x) = \log_3 (4x-1) \Rightarrow f^{-1}(\log_3 (4x-1)) = x$

$\log_3 (4x-1) = 3$

$4x - 1 = 27$

$4x = 28$

$x = 7$

Yanıt / The Answer is C

11. $\log_3 (x+4) < \log_{3^2} 4^2$

$\log_3 (x+4) < \log_3 4$

$x + 4 < 4$

$x < 0$

$x + 4 > 0 \Rightarrow x > -4$

$\sum x = -3 - 2 - 1 = -6$

Yanıt / The Answer is E

12. $\log_{\frac{1}{3}} (x+5) < \log_3 \dfrac{1}{7}$

$\log_{\frac{1}{3}} (x+5) < \log_{\frac{1}{3}} 7$

$x + 5 > 7$

$x > 2$

$\Rightarrow$ ÇK(SS) $= (2, \infty)$

Yanıt / The Answer is C

1. $\log_5 x = -3 \Rightarrow \mathbf{x = ?}$

Yanıt / The Answer is: $\frac{1}{125}$

2. $3\log_4(x + 2) = 9 \Rightarrow \mathbf{x = ?}$

Yanıt / The Answer is: **62**

3. $\log_2(x - 4) = 5 \Rightarrow \mathbf{\log_6 x = ?}$

Yanıt / The Answer is: **2**

4. $\log_3(x + 1) = 2 \Rightarrow \mathbf{\log_2 x = ?}$

Yanıt / The Answer is: **3**

5. $\left.\begin{array}{l} \log(x \cdot y) = 3 \\ \log \dfrac{x}{y} = 1 \end{array}\right\} \Rightarrow \mathbf{x = ?}$

Yanıt / The Answer is: **100**

6. $3^{\log_9 125} = 5^{x+1} \Rightarrow \mathbf{x = ?}$

Yanıt / The Answer is: $\frac{1}{2}$

7. $\log 2 = a \Rightarrow \mathbf{\log 25 = ?}$

Yanıt / The Answer is: **2 – 2a**

8. $f(x) = \log_3(2x - 1) \Rightarrow \mathbf{f^{-1}(3) = ?}$

Yanıt / The Answer is: **14**

9. $\log_5(\log_4(\log_3(\log_2(x)))) = 0 \Rightarrow \mathbf{x = ?}$

Yanıt / The Answer is: $\mathbf{2^{81}}$

10. $3^{\log_2 x} = 7^{\log_2 3} \Rightarrow \mathbf{x = ?}$

Yanıt / The Answer is: **7**

11. $\mathbf{\log_3(\log_2 27 \cdot \log_3 8) = ?}$

Yanıt / The Answer is: **2**

12. $x \in Z$,

$\log_5 x + \log_5(x + 5) \le \log_5 3 + \log_5 2 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is: **{1}**

1. $\log_{\frac{1}{3}} x = -\log_3 4 \Rightarrow \mathbf{x = ?}$

A) $\frac{1}{4}$
B) $\frac{1}{2}$
C) 1
D) 2
E) 4

2. $\log_3(\log_5(\log_2(5x+2))) = 0 \Rightarrow \mathbf{x = ?}$

A) 6
B) 7
C) 8
D) 9
E) 10

3. $\log_9 x = -\frac{1}{2} \Rightarrow \mathbf{x = ?}$

A) $\frac{1}{9}$
B) $\frac{1}{3}$
C) 1
D) 3
E) 9

4. $\log_2(2 + 5\log_3 x) = 5 \Rightarrow \mathbf{\log_9 x = ?}$

A) 3
B) 4
C) 5
D) 6
E) 7

5. $\mathbf{\log_{25}81 \cdot \log_8 49 \cdot \log_9 125 \cdot \log_7 4 = ?}$

A) 3
B) $\frac{7}{2}$
C) 4
D) $\frac{9}{2}$
E) 5

6. $\log_2 5 = a \Rightarrow \mathbf{\log 20 = ?}$

A) $\frac{1+a}{a}$
B) $\frac{2+a}{1+a}$
C) $\frac{3+a}{2+a}$
D) $\frac{1+2a}{2+a}$
E) $\frac{2+a}{2a}$

7. $f(x) = \log_2(4x + m)$,

$f^{-1}(3) = -1 \Rightarrow$ **m = ?**

A) 4 B) 8 C) 12

D) 16 E) 18

8. $\log 2 = m$ ve(and) $\log 3 = n \Rightarrow$ **$\log_{24} 12 = ?$**

A) $\frac{m+n}{2m+n}$ B) $\frac{2m+n}{m+2n}$ C) $\frac{2m+n}{3m+n}$

D) $\frac{3m+n}{m+n}$ E) $\frac{m+3n}{m+n}$

9. **$\log_{\sqrt{3}} 4 \cdot \log_8 25 \cdot \log_5 27 = ?$**

A) 2 B) 4 C) 6

D) 8 E) 9

10. $x \in Z$,

$(\log_3(x-3))^2 - 4 \cdot \log_3 (x-3) - 5 = 0$

$\Rightarrow$ **x = ?**

A) 30 B) 84 C) 246

D) 732 E) 750

11. $(\log_2 x)^2 - 5\log_2 x + 6 = 0 \Rightarrow$ **$\sum x = ?$**

A) 8 B) 9 C) 10

D) 12 E) 15

12. $x \in Z$,

$\log_3 (\log_{\frac{1}{2}} (x+1)) < 0 \Rightarrow$ **min(x) = ?**

A) 4 B) 3 C) 2

D) 1 E) 0

YANITLAR / ANSWERS

1. E	2. A	3. B	4. A	5. C	6. B	7. C	8. C
9. D	10. C	11. D	12. E				

1. $\log_2 x - 2 = \log_2 y \Rightarrow$ **x = ?**

A) y B) 2y C) 3y D) 4y E) 5y

2. $\left.\begin{matrix} \ln(ab) = 5 \\ \ln(\frac{a}{b}) = 1 \end{matrix}\right\} \Rightarrow$ **a = ?**

A) 1 B) e C) e^2 D) e^3 E) e^4

3. $\dfrac{\log_3 x}{\log_x 3} = 4 \Rightarrow \prod x = ?$

A) 1 B) 2 C) 3 D) 8 E) 9

4. $2^{4+\ln x} + 2^{\ln x} = 272 \Rightarrow$ **x = ?**

A) e^5 B) e^4 C) e^3 D) e^2 E) e

5. $\log_3(4x - 2) = 1 + \log_3(x + 7)$

$\Rightarrow$ **x = ?**

A) 23 B) 25 C) 27 D) 29 E) 32

6. $\log_3 5 = a \Rightarrow$ **$\log_{15} 25$ = ?**

A) $\frac{a}{a+2}$ B) $\frac{2a}{a+2}$ C) $\frac{a+1}{a}$ D) $\frac{2a}{a+1}$ E) $\frac{3a}{a+2}$

7. $\log_5 3 = a,\ \log_5 7 = b \Rightarrow \log_{35} 9 = ?$

A) $\frac{a+1}{3+b}$ B) $\frac{a}{2+b}$ C) $\frac{2a}{1+b}$

D) $\frac{a+1}{b}$ E) $\frac{3a}{2+b}$

8. $f(x) = 3^{4x-1} \Rightarrow f^{-1}(\sqrt{3}) = ?$

A) $\frac{1}{8}$ B) $\frac{1}{4}$ C) $\frac{3}{8}$

D) $\frac{1}{2}$ E) $\frac{5}{8}$

9. $f(x) = 2\log_3 x - 5 \Rightarrow f^{-1}(x) = ?$

A) $\sqrt{3^{x+2}}$ B) $\sqrt{3^{x+3}}$ C) $\sqrt{3^{x+4}}$

D) $\sqrt{3^{x+5}}$ E) $\sqrt{3^{x+6}}$

10.
$$\left.\begin{aligned} x &= \log_4 \frac{1}{15} \\ y &= \log_3 \frac{1}{2} \\ z &= \log_5 \frac{1}{30} \end{aligned}\right\} \Rightarrow ? < ? < ?$$

A) $x < y < z$ B) $z < x < y$ C) $z < y < x$

D) $y < x < z$ E) $x < z < y$

11. $\log_3 x = \frac{1}{8} \Rightarrow \log_9 3x^4 = ?$

A) $\frac{1}{4}$ B) $\frac{1}{2}$ C) $\frac{3}{4}$

D) 1 E) $\frac{5}{4}$

12. $f\left(\frac{9}{16}\right) = ?$

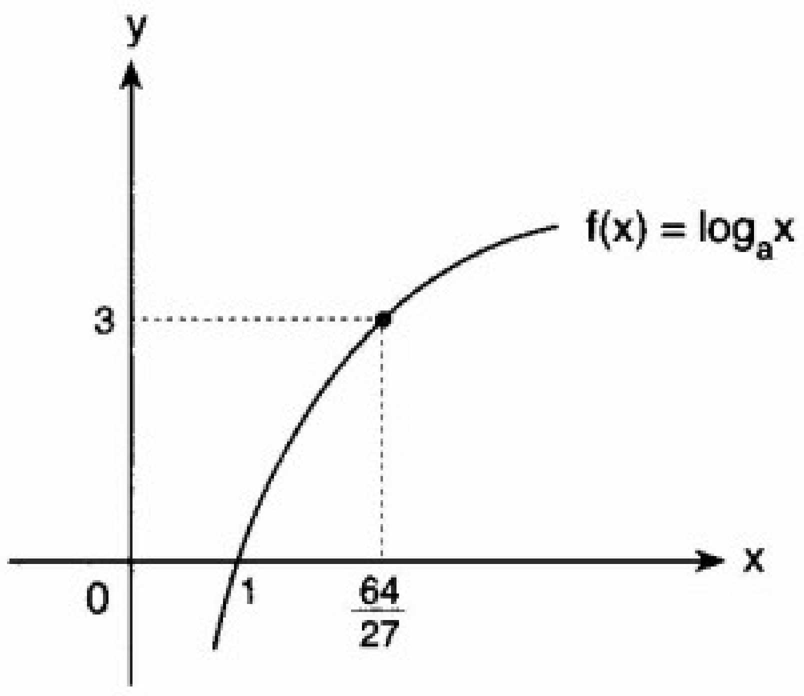
A) 2

B) 1

C) 0

D) –1

E) –2



YANITLAR / ANSWERS

1. D	2. D	3. A	4. B	5. A	6. D	7. C	8. C
9. D	10. B	11. C	12. E				

1. $\log(2x + 16) = 1 + \log 2 + \log(x - 1) \Rightarrow$ **$x = ?$**

A) 1 B) 2 C) 3 D) 4 E) 5

2. **$\ln 6 \cdot \log_6 8 \cdot \log_2 e = ?$**

A) 3 B) 5 C) 6 D) 7 E) 8

3. $\left.\begin{matrix}\log_3 2 = a \\ \log_2 5 = b\end{matrix}\right\} \Rightarrow$ **$\log_5 6 = ?$**

A) $\frac{1+ab}{a}$ B) $\frac{1+2a}{b}$ C) $\frac{1+a}{ab}$ D) $\frac{2+a}{ab}$ E) $\frac{1+b}{2a}$

4. **$\log_3\sqrt{7}\cdot\log_{49}8\cdot\log_4 27 = ?$**

A) $\frac{3}{4}$ B) $\frac{7}{8}$ C) 1 D) $\frac{9}{8}$ E) $\frac{5}{4}$

5. $\left.\begin{matrix}\log_3 5 = a \\ \log_2 3 = b\end{matrix}\right\} \Rightarrow$ **$\log_6 5 = ?$**

A) $\frac{ab}{b+1}$ B) $\frac{2a}{b+3}$ C) $\frac{3b}{b+2}$ D) $\frac{ab}{b+2}$ E) $\frac{ab}{a+4}$

6. $\left.\begin{matrix}\log_3 5 = a \\ \log_3 2 = b\end{matrix}\right\} \Rightarrow$ **$\log 25 = ?$**

A) $\frac{a}{a+b}$ B) $\frac{2a}{a+b}$ C) $\frac{2a}{a+2b}$ D) $\frac{3a}{a+b}$ E) $\frac{a}{3a+b}$

7. $\log_3 2 = a$ ve (and) $\log_3 5 = b \Rightarrow$ **$\log 50 = ?$**

A) $\frac{a+2b}{a+b}$ B) $\frac{2a+b}{a+3b}$ C) $\frac{a+b}{a+2b}$

D) $\frac{3a+b}{a+b}$ E) $\frac{a+3b}{a+b}$

8. $f(x) = \sqrt{5^{x+1}} \Rightarrow$ **$f^{-1}(x) = ?$**

A) $2\log_5 x + 2$

B) $2\log_5 x - 1$

C) $5\log_2 x - 1$

D) $5\log_2 x + 3$

E) $\log_2 x + 5$

9. $3\sqrt{\ln x} - 2\ln\sqrt{x} = 0 \Rightarrow$ **ÇK(SS) = ?**

A) $\{1, e^3\}$ B) $\{e^3, e^9\}$ C) $\{e, e^3\}$

D) $\{e, e^9\}$ E) $\{1, e^9\}$

10. $\log_a 3 = 2$,

$\log_3(a \cdot 3^b) = 7 \Rightarrow$ **$b = ?$**

A) $\frac{11}{2}$ B) 6 C) $\frac{13}{2}$

D) 7 E) $\frac{15}{2}$

11. $\left.\begin{array}{l}\log_4 7 = a \\ \log_4 5 = b \\ \log_4 3 = c\end{array}\right\} \Rightarrow$ **$\log_4 525 = ?$**

A) $a + 2b + c$ B) $2a + b + c$ C) $a + 3b + 2c$

D) $a + 2b + 2c$ E) $a + b + c$

12. $f(x) = \log_2(3x + 1)$,

$g(x) = 2x - 5 \Rightarrow$ **$(fog)^{-1}(4) = ?$**

A) 5 B) 3 C) 1

D) –3 E) –5

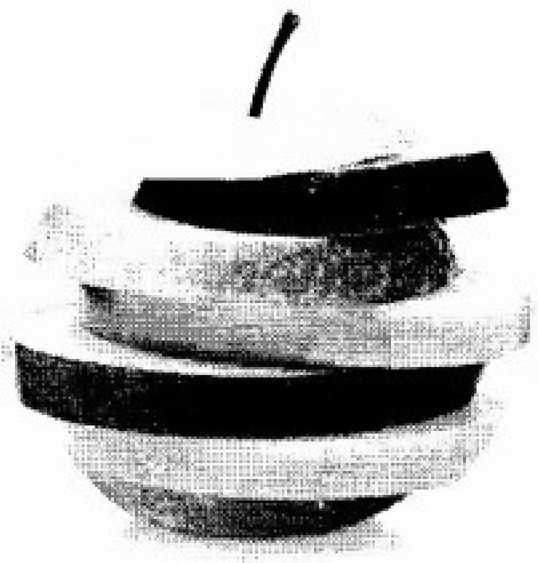
YANITLAR / ANSWERS							
1. B	**2. A**	**3. C**	**4. D**	**5. A**	**6. B**	**7. A**	**8. B**
9. E	**10. C**	**11. A**	**12. A**				

ÜNİTE 8

UNIT

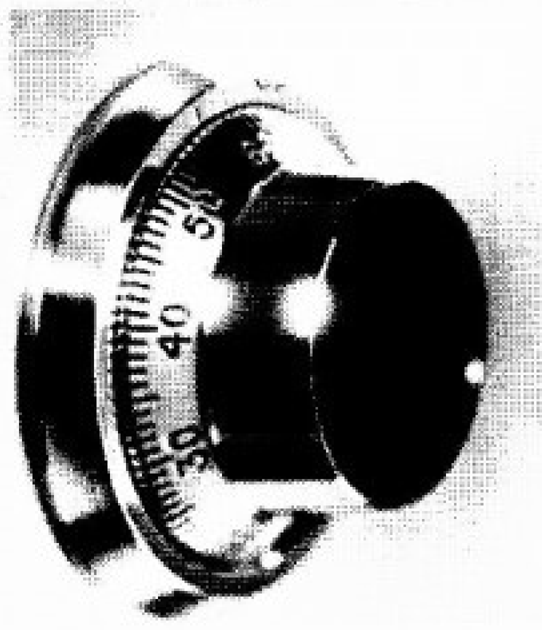
Bu ünitede; tümevarım, diziler ve seriler; permütasyon, kombinasyon ve binom açılımı; matris ve determinant ayrıntılı açıklanmıştır.

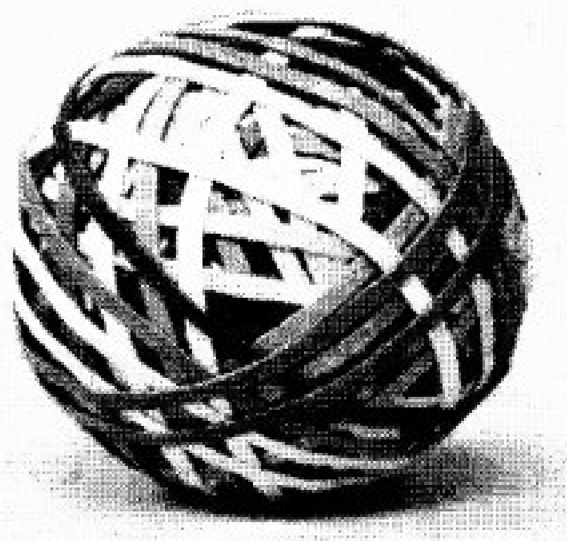
Bu ünite; 96 çözümlü örnek, 36 alıştırma ve 96 test sorusundan oluşmaktadır.

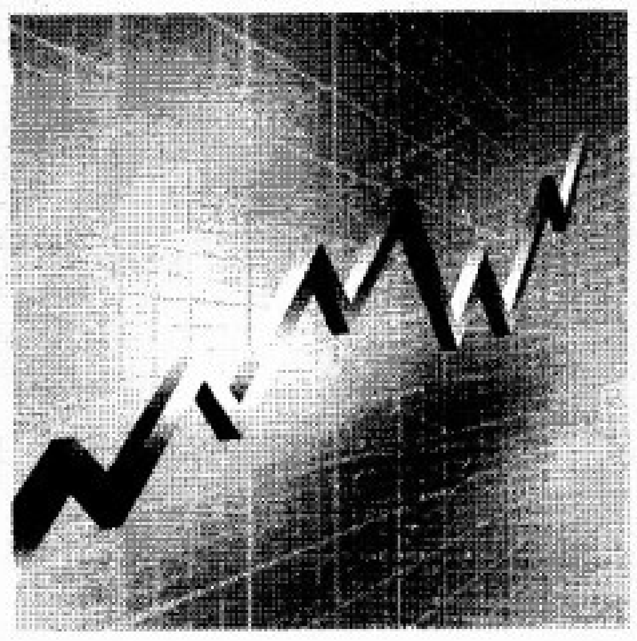


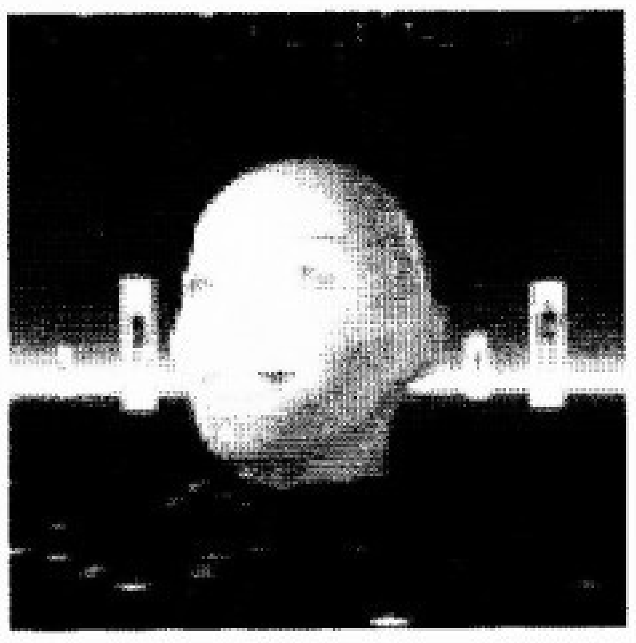
In this unit, induction, sequences and series; permutation, combination and binomial expansion; matrix and determinant are explained in detailed.

This unit includes; 96 test questions.









- **TÜMEVARIM, DİZİLER ve SERİLER**
  INDUCTION, SEQUENCES, and SERIES .... 557 – 584
- **BİNOM AÇILIMI**
  BINOMIAL EXPANSION .... 585 – 596
- **MATRİS ve DETERMİNANT**
  MATRIX and DETERMINANT .... 597 – 626

1. $\sum_{k=1}^{15} k = ?$

A) 90

B) 105

C) 120

D) 135

E) 150

2. $\sum_{k=1}^{12} k^2 = ?$

A) 640

B) 650

C) 660

D) 670

E) 680

3. $\sum_{k=1}^{35} \left(\frac{1}{k} - \frac{1}{k+1}\right) = ?$

A) $\frac{33}{34}$

B) $\frac{34}{35}$

C) $\frac{35}{36}$

D) $\frac{36}{37}$

E) $\frac{37}{38}$

4. $\sum_{k=1}^{99} \log \frac{k}{k+1} = ?$

A) –2

B) –3

C) –4

D) –5

E) –6

5. $i = \sqrt{-1}$

$\Rightarrow \sum_{k=1}^{40} i^k = ?$

A) 1 – i

B) –i

C) –1

D) 0

E) i

6. $\sum_{m=1}^{3} \sum_{k=0}^{2} \sum_{i=2}^{4} (k+i+m) = ?$

A) 124

B) 136

C) 144

D) 158

E) 162

7. $\prod_{k=1}^{25} k = ?$

A) 22!

B) 23!

C) 24!

D) 25!

E) 26!

8. $\prod_{k=5}^{29} \left(\frac{k+2}{k+3}\right) = ?$

A) $\frac{3}{28}$

B) $\frac{4}{29}$

C) $\frac{1}{6}$

D) $\frac{6}{31}$

E) $\frac{7}{32}$

9. $\prod_{k=1}^{32} 2^k = 2^x \Rightarrow x = ?$

A) 515

B) 518

C) 520

D) 525

E) 528

10. $f(x) = x^2 - 5x + c$, ÇK(SS) = $\{x_1, x_2\}$,

$\prod_{k=1}^{2} x_k = 8 \Rightarrow c = ?$

A) –8

B) –4

C) 2

D) 4

E) 8

11. $\sum_{k=1}^{10} \prod_{m=1}^{2} (k+m) = ?$

A) 550

B) 560

C) 570

D) 580

E) 590

12. $\prod_{k=2}^{60} \left(1 + \frac{1}{k-1}\right) = ?$

A) 59

B) 60

C) 61

D) 62

E) 63

YANITLAR / ANSWERS

1. C	2. B	3. C	4. A	5. D	6. E	7. D	8. E
9. E	10. E	11. C	12. B				

1. $\sum_{k=1}^{15} k = \frac{15 \cdot 16}{2}$

$= 120$

Yanıt / The Answer is C

2. $\sum_{k=1}^{12} k^2 = \frac{12 \cdot 13 \cdot 25}{6}$

$= 650$

Yanıt / The Answer is B

3. $\sum_{k=1}^{35} \left(\frac{1}{k} - \frac{1}{k+1}\right) = \sum_{k=1}^{35} \frac{(k+1)-k}{k \cdot (k+1)}$

$= \sum_{k=1}^{35} \frac{1}{k \cdot (k+1)}$

$= \frac{35}{36}$

Yanıt / The Answer is C

4. $\sum_{k=1}^{99} \log \frac{k}{k+1} = \log \frac{1}{2} + \log \frac{2}{3} + \ldots + \log \frac{99}{100}$

$= \log\left(\frac{1}{2} \cdot \frac{2}{3} \cdot \ldots \cdot \frac{99}{100}\right)$

$= \log \frac{1}{100} = -2$

Yanıt / The Answer is A

5. $\sum_{k=1}^{40} i^k = i^1 + i^2 + \ldots + i^{40}$

$$\left.\begin{array}{l} i^1 = i \\ i^2 = -1 \\ i^3 = -i \\ i^4 = 1 \end{array}\right\} \Rightarrow i + (-1) + (-i) + 1 + \ldots + 1 = 0$$

Yanıt / The Answer is D

6. $\sum_{m=1}^{3} \sum_{k=0}^{2} \sum_{i=2}^{4} (k+i+m) = \sum_{m=1}^{3} \sum_{k=0}^{2} (9+3k+3m)$

$= \sum_{m=1}^{3} (27+9m+9)$

$= \sum_{m=1}^{3} (36+9m)$

$= 3 \cdot 36 + 9 \cdot 6$

$= 108 + 54 = 162$

Yanıt / The Answer is E

7. $\prod_{k=1}^{25} k = 25!$

Yanıt / The Answer is D

8. $\prod_{k=5}^{29} \frac{k+2}{k+3} = \frac{7}{8} \cdot \frac{8}{9} \cdot \frac{9}{10} \cdot \ldots \cdot \frac{31}{32}$

$= \frac{7}{32}$

Yanıt / The Answer is E

9. $\prod_{k=1}^{32} 2^k = 2^{\frac{32 \cdot 33}{2}} = 2^x$

$2^{528} = 2^x$

$x = 528$

Yanıt / The Answer is E

10. $\prod_{k=1}^{2} x_k = x_1 \cdot x_2 = 8$

$f(x) = x^2 - 5x + c \Rightarrow x_1 \cdot x_2 = \frac{c}{1}$

$c = 8$

Yanıt / The Answer is E

11. $\sum_{k=1}^{10} \prod_{m=1}^{2} (k+m) = \sum_{k=1}^{10} (k+1) \cdot (k+2)$

$\sum_{k=1}^{10} (k^2 + 3k + 2) = \sum_{k=1}^{10} k^2 + \sum_{k=1}^{10} 3k + \sum_{k=1}^{10} 2$

$= \frac{10 \cdot 11 \cdot 21}{6} + 3 \cdot \frac{10 \cdot 11}{2} + 2 \cdot 10$

$= 385 + 165 + 20$

$= 570$

Yanıt / The Answer is C

12. $\prod_{k=2}^{60} \left(1 + \frac{1}{k-1}\right) = \prod_{k=2}^{60} \left(\frac{k}{k-1}\right)$

$= \frac{2}{1} \cdot \frac{3}{2} \cdot \frac{4}{3} \cdot \ldots \cdot \frac{60}{59} = 60$

Yanıt / The Answer is B

1. $\sum_{k=45^\circ}^{315^\circ} \sin k = ?$

Yanıt / The Answer is: **0**

2. $\sum_{k=5}^{103} \log\left(1-\frac{1}{k-3}\right) = ?$

Yanıt / The Answer is: **–2**

3. $\ln\left(\prod_{k=10}^{30} e^{k}\right) = ?$

Yanıt / The Answer is: **420**

4. $\sum_{m=0}^{7} \prod_{k=1}^{9} \left(1-\frac{1}{k+3}\right) = ?$

Yanıt / The Answer is: **2**

5. $\sum_{k=4}^{51} \prod_{n=1}^{15} \left(\frac{n}{n+1}\right) = ?$

Yanıt / The Answer is: **3**

6. $\prod_{k=1}^{10} \left(\frac{3}{7}\right)^{k} = \left(\frac{7}{3}\right)^{x} \Rightarrow x = ?$

Yanıt / The Answer is: **–55**

7. $\sum_{k=1}^{20}(3k-2)=?$

Yanıt / The Answer is: **590**

8. $\prod_{k=-2}^{11}(15-3k)=?$

Yanıt / The Answer is: **0**

9. $\sum_{k=6}^{n}\log_5\left(1-\frac{1}{k}\right)=-1 \Rightarrow n=?$

Yanıt / The Answer is: **25**

10. $\prod_{n=91}^{179}\tan x=?$

Yanıt / The Answer is: **–1**

11. $a_n=(3n-1) \Rightarrow \frac{a_5}{a_2}=?$

Yanıt / The Answer is: $\frac{14}{5}$

12. $a_n=3^n \Rightarrow \frac{a_{n+1}}{a_n}=?$

Yanıt / The Answer is: **3**

1. $\sum_{k=1}^{10} k^2 = ?$

A) 332
B) 348
C) 356
D) 385
E) 406

2. $\sum_{k=1}^{15} (3k+2) = ?$

A) 380
B) 390
C) 400
D) 410
E) 420

3. $\sum_{k=1}^{25} (2k-4) = ?$

A) 520
B) 530
C) 540
D) 550
E) 560

4. $\sum_{k=1}^{n} (k-2) = 20 \Rightarrow n = ?$

A) 5
B) 6
C) 7
D) 8
E) 9

5. $\sum_{k=1}^{n} (2k+1) = 120 \Rightarrow n = ?$

A) 6
B) 7
C) 8
D) 9
E) 10

6. $\sum_{k=-2}^{16} (k+3) = ?$

A) 170
B) 180
C) 190
D) 200
E) 210

7. $\sum_{k=-5}^{6} k^3 = ?$

A) 184
B) 196
C) 198
D) 208
E) 216

8. $f(x) = 2x - 5 \Rightarrow$

$\sum_{k=1}^{3} f(k) = ?$

A) –4
B) –3
C) –2
D) –1
E) 0

9. $\sum_{k=-7}^{43} a = 153 \Rightarrow a = ?$

A) 3
B) 4
C) 5
D) 6
E) 7

10. $\sum_{k=n}^{n+3} (k+2) = 26 \Rightarrow n = ?$

A) 3
B) 4
C) 5
D) 6
E) 7

11. $\sum_{m=1}^{3} \sum_{k=-1}^{1} (2k+m) = ?$

A) 10
B) 12
C) 15
D) 16
E) 18

12. $f(x) = x^2 + 3x - 1 \Rightarrow$

$\sum_{k=1}^{2} f(k) = ?$

A) 9
B) 10
C) 12
D) 14
E) 15

YANITLAR / ANSWERS							
1. D	2. B	3. D	4. D	5. E	6. C	7. E	8. B
9. A	10. A	11. E	12. C				

1. $\prod_{k=1}^{29} \frac{k}{k+1} = ?$

A) $\frac{1}{27}$

B) $\frac{1}{28}$

C) $\frac{1}{29}$

D) $\frac{1}{30}$

E) $\frac{1}{31}$

2. $\prod_{k=3}^{25} 3^k = 3^x \Rightarrow x = ?$

A) 318

B) 320

C) 322

D) 332

E) 338

3. $\prod_{k=1}^{12} (2 \cdot k) = ?$

A) $2^{13} \cdot 12!$

B) $2^{12} \cdot 12!$

C) $2^{11} \cdot 11!$

D) $2^{12} \cdot 13!$

E) $2^{12} \cdot 78$

4. $\prod_{k=1}^{10} [k \cdot (k+1)] = ?$

A) 9!·10!

B) 10!·11!

C) 11!·12!

D) 12!·13!

E) 13!·14!

5. $\prod_{k=8}^{25} k = ?$

A) $\frac{25!}{7!}$

B) $\frac{25!}{8!}$

C) $\frac{24!}{7!}$

D) $\frac{24!}{8!}$

E) $\frac{26!}{8!}$

6. $\prod_{k=-3}^{15} (k+5) = ?$

A) 15!

B) 16!

C) 18!

D) 19!

E) 20!

7. $\prod_{k=2}^{9}\left(\sin\frac{\pi k}{2}\right)=?$

A) –2

B) –1

C) 0

D) 1

E) 2

8. $\prod_{k=5}^{20} e^{\ln(k-4)}=?$

A) 13!

B) 14!

C) 15!

D) 16!

E) 17!

9. $\prod_{k=4}^{63}\left(\log_k(k+1)\right)=?$

A) 1

B) 2

C) 3

D) 4

E) 5

10. $\prod_{k=2}^{3}\prod_{i=1}^{2}(i^2-1)\cdot(k+1)=?$

A) –156

B) 0

C) 98

D) 158

E) 186

11. $\sum_{k=1}^{20}\prod_{m=2}^{3}3=?$

A) 153

B) 162

C) 171

D) 180

E) 189

12. $\prod_{k=1}^{5}\sum_{m=1}^{3}\frac{m}{k}=?$

A) $\frac{324}{5}$

B) $\frac{328}{5}$

C) $\frac{332}{5}$

D) $\frac{338}{5}$

E) $\frac{342}{5}$

YANITLAR / ANSWERS

1. D	2. C	3. B	4. B	5. A	6. E	7. C	8. D
9. C	10. B	11. D	12. A				

1. $f(x) = 3x + 5$,

$x_1 = -2,\ x_2 = 1,\ x_3 = 4 \Rightarrow \sum_{k=1}^{3} \left[2x_k + f(x_k) \right] = ?$

A) 25 B) 30 C) 32

D) 35 E) 36

2. $\sum_{k=1}^{23} (2k) = A,\ \sum_{k=8}^{23} (2k) = B \Rightarrow A - B = ?$

A) 52 B) 54 C) 56

D) 58 E) 60

3. $\sum_{m=1}^{4} \prod_{k=2}^{3} 2^k = ?$

A) 108 B) 116 C) 124

D) 128 E) 130

4. $\sum_{k=1}^{n} (2k - 5) = 77 \Rightarrow n = ?$

A) 9 B) 10 C) 11

D) 12 E) 13

5. $f(n) = \sum_{k=1}^{n} 3k \Rightarrow f(12) = ?$

A) 234 B) 238 C) 244

D) 246 E) 250

6. $\sum_{k=1}^{3} \sum_{i=1}^{3} (3k - i + 2) = ?$

A) 46 B) 48 C) 50

D) 52 E) 54

7. $\prod_{k=1}^{21} (a-3) = 8^7 \Rightarrow a = ?$

A) 2 B) 3 C) 4
D) 5 E) 6

8. $\sum_{k=1}^{4} \sum_{m=1}^{k} m = ?$

A) 18 B) 20 C) 21
D) 24 E) 25

9. $\prod_{k=5}^{124} \log_k (k+1) = ?$

A) 1 B) 2 C) 3
D) 4 E) 5

10. $\prod_{i=1}^{2} \sum_{k=2}^{4} (i+k-1) = ?$

A) 100 B) 108 C) 120
D) 132 E) 150

11. $\prod_{k=1}^{15} \left(\frac{2}{5}\right)^k = \left(\frac{5}{2}\right)^x \Rightarrow x = ?$

A) –40 B) –60 C) –80
D) –100 E) –120

12. $2x^2 + 6x - 8 = 0$, ÇK(SS) $= \{x_1, x_2\} \Rightarrow$

$\sum_{k=1}^{2} (x_k)^2 = ?$

A) 12 B) 16 C) 17
D) 18 E) 20

YANITLAR / ANSWERS

1. B	2. C	3. D	4. C	5. A	6. E	7. D	8. B
9. C	10. B	11. E	12. C				

1. $(a_n)=\begin{cases}3n-1 & n=2k\\ 5n+1 & n=2k+1\end{cases}$

$\Rightarrow \mathbf{a_{11}+a_{12}=?}$

A) 88

B) 91

C) 93

D) 95

E) 97

2. $(a_n)=\dfrac{3n-1}{2n+1} \Rightarrow \mathbf{a_{15}=?}$

A) $\dfrac{40}{31}$

B) $\dfrac{41}{31}$

C) $\dfrac{43}{31}$

D) $\dfrac{44}{31}$

E) $\dfrac{45}{31}$

3. $(a_n)=\dfrac{3n-2}{2n+1} \Rightarrow (\mathbf{a_{n+2}})=\mathbf{?}$

A) $\dfrac{3n}{2n+3}$

B) $\dfrac{3n+1}{2n+1}$

C) $\dfrac{3n+2}{2n+2}$

D) $\dfrac{3n+3}{2n+3}$

E) $\dfrac{3n+4}{2n+5}$

4. $(a_n)=\dfrac{3^n\cdot n!}{n+1} \Rightarrow \dfrac{\mathbf{a_{n-2}}}{\mathbf{a_{n-1}}}=\mathbf{?}$

A) $\dfrac{n!}{3(n-1)^2}$

B) $\dfrac{n}{3(n-1)^2}$

C) $\dfrac{n}{(n-1)^2}$

D) $\dfrac{3n}{(n-1)^2}$

E) $\dfrac{3}{(n-1)^2}$

5. $a_1 = 4,$

$a_{n+1} = a_n + n \Rightarrow \mathbf{a_{12} = ?}$

A) 65

B) 66

C) 68

D) 70

E) 72

6. $a_{2n-1}=\dfrac{4n+1}{2n-1} \Rightarrow \mathbf{a_n=?}$

A) $\left(\dfrac{2n+2}{n}\right)$

B) $\left(\dfrac{2n+3}{n}\right)$

C) $\left(\dfrac{4n+5}{2n}\right)$

D) $\left(\dfrac{8n-3}{4n+3}\right)$

E) $\left(\dfrac{8n-7}{4n+3}\right)$

7. $a_n = a_{n-1} + r,$

$a_3 = 4,\ \ a_{12} = 13 \Rightarrow \mathbf{a_{23} = ?}$

A) 21

B) 22

C) 23

D) 24

E) 25

8. $\left.\begin{array}{l} a_n = (a_{n-1}) \cdot r \\ a_1 = 6,\ r = \dfrac{1}{3} \end{array}\right\} \Rightarrow \mathbf{a_{20} = ?}$

A) $\dfrac{2}{3^{20}}$

B) $\dfrac{2}{3^{19}}$

C) $\dfrac{1}{3^{18}}$

D) $\dfrac{2}{3^{18}}$

E) $\dfrac{1}{3^{17}}$

9. $(a_n) = (a_{n-1}) + r$

$a_1 = 6,\ r = \dfrac{4}{3} \Rightarrow \mathbf{a_{13} = ?}$

A) 22

B) 24

C) 26

D) 28

E) 30

10. $(a_n) = \dfrac{1}{(n+1)(n+2)} \Rightarrow \sum\limits_{n=1}^{18} (a_n) = ?$

A) $\dfrac{9}{20}$ B) $\dfrac{11}{20}$ C) $\dfrac{3}{5}$

D) $\dfrac{7}{10}$ E) $\dfrac{2}{5}$

11. $\sum\limits_{n=2}^{\infty} \dfrac{1}{3^n} = ?$

A) $\dfrac{1}{6}$

B) $\dfrac{1}{3}$

C) $\dfrac{1}{2}$

D) 0

E) 1

12. $\sum\limits_{n=0}^{\infty} \left(\dfrac{2}{3}\right)^n = ?$

A) $\dfrac{1}{6}$

B) 1

C) $\dfrac{3}{2}$

D) 2

E) 3

YANITLAR / ANSWERS

1. B	2. D	3. E	4. B	5. D	6. B	7. D	8. D
9. A	10. A	11. A	12. E				

1. $(x + y)^4 = Ax^4 + Bx^3y + Cxy^2 + Dxy^3 + Ey^4$

$\Rightarrow$ **A + B + C = ?**

A) 9 B) 10 C) 11 D) 12 E) 13

2. $(x + y)^{10} = Ax^{10} + Bx^9y^8 + \ldots + Kx^3y^7 + \ldots + My^{10}$

$\Rightarrow$ **K = ?**

A) 120 B) 140 C) 160 D) 240 E) 300

3. $\left(x - \frac{2}{x}\right)^{10} = Ax^{10} + Bx^8 + \ldots + Kx^{-2} + \ldots + Mx^{-10}$

$\Rightarrow$ **K = ?**

A) $210 \cdot 2^5$ B) $210 \cdot 2^6$ C) $105 \cdot 2^6$ D) $100 \cdot 2^6$ E) $120 \cdot 2^7$

4. $\left(x - \frac{1}{x}\right)^{12} = Ax^{12} + Bx^{10} + \ldots + Kx^6 + \ldots + Mx^{-12}$

$\Rightarrow$ **K = ?**

A) 120 B) 200 C) 220 D) –120 E) –220

5. $\binom{n}{0}4^0 + \binom{n}{1}4^1 + \ldots + \binom{n}{n}4^n = 625 \Rightarrow$ **n = ?**

A) 4 B) 5 C) 6 D) 7 E) 8

6. $(x^3 + y^2)^{10} = Ax^{30} + Bx^{27}y^2 + \ldots + Mx^{15}y^{10} + \ldots + Ky^{20}$

$\Rightarrow$ **M = ?**

A) 200 B) 240 C) 252 D) 256 E) 320

7. $\left(x-\frac{3}{x}\right)^8 = \ldots + a\cdot x^4 \ldots \Rightarrow$ **$a = ?$**

A) 252 B) 256 C) 260
D) 264 E) 268

8. $\left.\begin{aligned} x^3+y^3 &= 19 \\ x^2y+xy^2 &= 15 \end{aligned}\right\} \Rightarrow$ **$x + y = ?$**

A) 2 B) 3 C) 4
D) 5 E) 6

9. $\left.\begin{aligned} x^2-xy &= 98 \\ xy-y^2 &= 17 \end{aligned}\right\} \Rightarrow$ **$|x - y| = ?$**

A) 5 B) 6 C) 7
D) 8 E) 9

10. $(\sqrt{x}+3)^6 = x^3 + \ldots + A\cdot x^2 + \ldots \Rightarrow$ **$A = ?$**

A) 110 B) 115 C) 125
D) 135 E) 140

11. $(x^2-2y+3z)^6 = \ldots + A\cdot x^6y^2\cdot z + \ldots \Rightarrow$ **$A = ?$**

A) 500 B) 600 C) 675
D) 720 E) 800

12. $(2a-2b+c)^8 = \ldots + x\cdot a^2\cdot b\cdot c^5 + \ldots \Rightarrow$ **$x = ?$**

A) –1344 B) –1200 C) –1000
D) 1120 E) 1342

YANITLAR / ANSWERS							
1. C	2. A	3. B	4. E	5. A	6. C	7. A	8. C
9. E	10. D	11. D	12. A				

1.

$$(x+y)^4 = \underbrace{\binom{4}{0}}_{A}x^4 + \underbrace{\binom{4}{1}}_{B}x^3y + \underbrace{\binom{4}{2}}_{C}x^2y^2 + \binom{4}{3}xy^3 + \binom{4}{4}y^4$$

$$\left.\begin{aligned} A &= \binom{4}{0} = \frac{4!}{(4-0)!\cdot 0!} = 1 \\ B &= \binom{4}{1} = \frac{4!}{(4-1)!\cdot 1!} = 4 \\ C &= \binom{4}{2} = \frac{4!}{(4-2)!\cdot 2!} = 6 \end{aligned}\right\} \Rightarrow A+B+C = 1+4+6 = 11$$

Yanıt / The Answer is C

2. $r = 7 \Rightarrow K = \binom{10}{7} = \dfrac{10!}{(10-7)!\cdot 7!} = 120$

Yanıt / The Answer is A

3. $(r+1)$. terim/term $= \binom{10}{r}\cdot x^{10-r}\cdot\left(\dfrac{-2}{x}\right)^r$

$$\Rightarrow x^{-2} = x^{10-r}\cdot\left(x^{-1}\right)^r$$

$$-2 = 10-r-r$$

$$r = 6$$

$$K\cdot x^{-2} = \binom{10}{6}\cdot x^{10-6}\cdot\left(\frac{2}{x}\right)^6$$

$$= \frac{10!}{(10-6)!\cdot 6!}\cdot x^4\cdot\frac{2^6}{x^{-6}}$$

$$= 210\cdot 2^6\cdot x^{-2} \Rightarrow K = 210\cdot 2^6$$

Yanıt / The Answer is B

4. $(r+1)$. terim / term $= \binom{12}{r}\cdot x^{12-r}\cdot\left(\dfrac{1}{x}\right)^r$

$$\Rightarrow K\cdot x^6 = \binom{12}{r}\cdot x^{12-r}\cdot(-x)^{-r}$$

$$x^6 = x^{12-r}\cdot x^{-r} \Rightarrow 6 = 12-2r \Rightarrow r = 3$$

$$K\cdot x^6 = \binom{12}{3}\cdot x^{12-3}\cdot\left(-\frac{1}{x}\right)^3$$

$$K\cdot x^6 = \frac{12!}{(12-3)!\cdot 3!}\cdot x^9\cdot\left(-x^{-3}\right)$$

$$K\cdot x^6 = -220\cdot x^6 \Rightarrow K = -220$$

Yanıt / The Answer is E

5. $\binom{n}{0}4^0 + \binom{n}{1}4^1 + \ldots + \binom{n}{n}4^n = (1+4)^n$

$$= 5^n$$

$$5^n = 625$$

$$n = 4$$

Yanıt / The Answer is A

6. $M\cdot x^{15}\cdot y^{10} = \binom{10}{r}\cdot\left(x^3\right)^{10-r}\cdot\left(y^2\right)^r$

$$y^{10} = \left(y^2\right)^r$$

$$10 = 2r$$

$$r = 5$$

$$\Rightarrow M = \binom{10}{5} = \frac{10!}{5!\cdot(10-5)!} = 252$$

Yanıt / The Answer is C

7. $\binom{8}{r} x^{8-r} \cdot \left(\frac{-3}{x}\right)^r \Rightarrow 8 - r - r = 4$

$$2r = 4$$

$$r = 2$$

$$\Rightarrow a = \binom{8}{2} \cdot (-3)^2 = \frac{8 \cdot 7}{2} \cdot 9$$

$$= 28 \cdot 9 = 252$$

Yanıt / The Answer is A

8.

$$x^3 + y^3 = 19$$

$$3\ /\ \ x^2y + xy^2 = 15$$

$$x^3 + 3x^2y + 3xy^2 + y^3 = 64$$

$$(x + y)^3 = 64$$

$$x + y = 4$$

Yanıt / The Answer is C

9.

$$x^2 - xy = 98$$

$$-\ /\ \ xy - y^2 = 17$$

$$x^2 - 2xy + y^2 = 81$$

$$(x - y)^2 = 81$$

$$|x - y| = 9$$

Yanıt / The Answer is E

10. $\binom{6}{r} \cdot \left(\sqrt{x}\right)^{6-r} \cdot 3^r = A \cdot x^2$

$$\frac{6-r}{2} = 2 \Rightarrow 6 - r = 4$$

$$r = 2$$

$$A = \binom{6}{2} \cdot 3^2 = 15 \cdot 9 = 135$$

Yanıt / The Answer is D

11. $\binom{6}{r} \cdot \binom{r}{k} \cdot (x^2)^{6-r} \cdot (-2y)^{r-k} \cdot (3z)^k = Ax^6y^2z$

$k = 1\ ,\ r = 3 \Rightarrow$

$$A = \binom{6}{3} \cdot \binom{3}{1} \cdot (-2)^2 \cdot 3 = 720$$

Yanıt / The Answer is D

12. $(2a - 2b + c)^8 = \ldots + x \cdot a^2 \cdot b \cdot c^5 + \ldots$

$$\binom{8}{r} \cdot \binom{r}{k} \cdot (2a)^{8-r} \cdot (-2b)^{r-k} \cdot (c)^k = x \cdot a^2 \cdot b \cdot c^5$$

$k = 5\ ,\ r = 6$

$$\Rightarrow x = \binom{8}{6} \cdot \binom{6}{5} \cdot (2)^2 \cdot (-2)^1 = -1344$$

Yanıt / The Answer is A

1. $(x-3)^5 = \ldots + a\cdot x^3 + \ldots \Rightarrow$ **a = ?**

Yanıt / The Answer is: **90**

2. $(x-3)^4 = \ldots + a\cdot x^3 \ldots \Rightarrow$ **a = ?**

Yanıt / The Answer is: **–12**

3. $(x-2)^7 = \ldots + a\cdot x^4 \ldots \Rightarrow$ **a = ?**

Yanıt / The Answer is: **–280**

4. $(x-3)^7 = \ldots + a\cdot x^5 \ldots \Rightarrow$ **a = ?**

Yanıt / The Answer is: **189**

5. $\left(x-\frac{3}{x}\right)^6 = \ldots + a\cdot x^2 \ldots \Rightarrow$ **a = ?**

Yanıt / The Answer is: **135**

6. $\left(x+\frac{2}{x}\right)^7 = \ldots + a\cdot x^5 \ldots \Rightarrow$ **a = ?**

Yanıt / The Answer is: **14**

7. $(4-x)^5 = 4^5 \ldots + A \cdot x^3 + \ldots - x^5 \;\Rightarrow\; \mathbf{A = ?}$

Yanıt / The Answer is: **–160**

8. $x^4 + y^4 = 41$

$2x^3y + 3x^2y^2 + 2xy^3 = 20$

$\Rightarrow\; \mathbf{x + y = ?}$

Yanıt / The Answer is: **–12**

9. $(2a - 3b)^6 = 64a^6 \ldots + x \cdot a^3 \cdot b^3 + \ldots$

Yanıt / The Answer is: **–4320**

10. $(2x - y^2)^8 = \ldots + k \cdot x^3 y^{10} \ldots \;\Rightarrow\; \mathbf{k = ?}$

Yanıt / The Answer is: **–448**

11. $\left.\begin{array}{l} x = a - \sqrt{2} \\ y = a + \sqrt{2} \end{array}\right\} \Rightarrow\; \mathbf{x^3 + 3x^2y + 3xy^2 + y^3 = ?}$

Yanıt / The Answer is: **$8a^3$**

12. $(a - 2b + c)^{10} = \ldots + m \cdot a \cdot b^2 \cdot c^7 + \ldots \;\Rightarrow\; \mathbf{m = ?}$

Yanıt / The Answer is: **1440**

1. $(x-y)^n = \ldots + a \cdot x^3 \cdot y^5 \ldots \Rightarrow$ **n = ?**

A) 3

B) 4

C) 5

D) 7

E) 8

2. $(x+y)^n = \ldots + a \cdot x^3 \cdot y^7 \ldots \Rightarrow$ **n = ?**

A) 7

B) 8

C) 9

D) 10

E) 11

3. $(x+2)^4 = \ldots + a \cdot x^2 \ldots \Rightarrow$ **a = ?**

A) 12

B) 16

C) 18

D) 20

E) 24

4. $(x-3)^6 = \ldots + a \cdot x^5 + \ldots \Rightarrow$ **a = ?**

A) –20

B) –18

C) –16

D) –15

E) –14

5. $(x-2y)^5 = \ldots + a \cdot x^4 \cdot y^n \ldots \Rightarrow$ **a + n = ?**

A) –6

B) –7

C) –8

D) –9

E) –10

6. $(x+y)^7 = \ldots + a \cdot x^4 \cdot y^n \ldots \Rightarrow$ **a + n = ?**

A) 34

B) 35

C) 36

D) 37

E) 38

7. $\left(x+\frac{1}{x}\right)^5 = \ldots + a \cdot x \ldots \Rightarrow$ **$a = ?$**

A) 5

B) 10

C) 15

D) 20

E) 25

8. $\left(x-\frac{2}{x}\right)^6 = \ldots + a \cdot x^2 \ldots \Rightarrow$ **$a = ?$**

A) 60

B) 64

C) 68

D) 70

E) 72

9. $(x-5)^4 = \ldots + a \cdot x^3 \ldots \Rightarrow$ **$a = ?$**

A) –15

B) –20

C) –25

D) –30

E) –35

10. $\left.\begin{array}{l} 3ab^2 + a^3 = 35 \\ 3a^2b + b^3 = 27 \end{array}\right\} \Rightarrow$ **$a - b = ?$**

A) 2

B) 3

C) 4

D) 5

E) 6

11. $\left.\begin{array}{l} a^3 + b^3 = 62 \\ ab(a+b) = 21 \end{array}\right\} \Rightarrow$ **$a + b = ?$**

A) 2

B) 3

C) 4

D) 5

E) 6

12. $\left.\begin{array}{l} a^3 - b^3 = 12 \\ ab(b-a) = 5 \end{array}\right\} \Rightarrow$ **$a - b = ?$**

A) 3

B) 4

C) 5

D) 6

E) 7

YANITLAR / ANSWERS

1. E	**2. D**	**3. E**	**4. B**	**5. D**	**6. E**	**7. B**	**8. A**
9. B	**10. A**	**11. D**	**12. A**				

1. $\begin{bmatrix} 5 & y \\ 2x & 4 \end{bmatrix} = \begin{bmatrix} 5 & z-1 \\ 4y & z \end{bmatrix} \Rightarrow \mathbf{x+y+z=?}$

A) 11 B) 12 C) 13 D) 14 E) 15

2. $\begin{bmatrix} \mathbf{2} & \mathbf{-1} & \mathbf{0} \\ \mathbf{3} & \mathbf{1} & \mathbf{2} \end{bmatrix} \cdot \begin{bmatrix} \mathbf{3} & \mathbf{0} \\ \mathbf{-1} & \mathbf{2} \\ \mathbf{4} & \mathbf{1} \end{bmatrix} = \mathbf{?}$

A) $\begin{bmatrix} 7 & -2 \\ 16 & 4 \end{bmatrix}$ B) $\begin{bmatrix} 6 & -3 \\ 14 & 3 \end{bmatrix}$ C) $\begin{bmatrix} -6 & 5 \\ 4 & 16 \end{bmatrix}$ D) $\begin{bmatrix} -10 & 9 \\ 12 & 5 \end{bmatrix}$ E) $\begin{bmatrix} -3 & 4 \\ 2 & 12 \end{bmatrix}$

3. $A = \begin{bmatrix} -2 & 1 & 3 \\ 4 & 2 & 1 \end{bmatrix}, \; B = \begin{bmatrix} -1 & 2 \\ 3 & 1 \end{bmatrix} \Rightarrow \mathbf{A^T \cdot B = ?}$

A) $\begin{bmatrix} 5 & 4 \\ -2 & 3 \\ 6 & 1 \end{bmatrix}$ B) $\begin{bmatrix} -10 & 3 \\ 5 & 1 \\ 4 & 2 \end{bmatrix}$ C) $\begin{bmatrix} 0 & 15 \\ 3 & 4 \\ 6 & 2 \end{bmatrix}$ D) $\begin{bmatrix} 12 & 1 \\ 3 & 7 \\ -1 & 6 \end{bmatrix}$ E) $\begin{bmatrix} 14 & 0 \\ 5 & 4 \\ 0 & 7 \end{bmatrix}$

4. $A = \begin{bmatrix} -3 & 4 \\ 5 & 2 \end{bmatrix}, \; f(x) = x^2 - 3x + 5 \Rightarrow \mathbf{f(A) = ?}$

A) $\begin{bmatrix} -15 & 16 \\ -30 & 28 \end{bmatrix}$ B) $\begin{bmatrix} -12 & 8 \\ -20 & 16 \end{bmatrix}$ C) $\begin{bmatrix} 15 & -16 \\ -18 & 25 \end{bmatrix}$ D) $\begin{bmatrix} 43 & -16 \\ -20 & 23 \end{bmatrix}$ E) $\begin{bmatrix} 23 & -14 \\ 19 & -15 \end{bmatrix}$

5. $A = \begin{bmatrix} 1 & 4 \\ 0 & -1 \end{bmatrix} \Rightarrow \mathbf{A^{50} = ?}$

A) I_2 B) $2^{25} \cdot I_2$ C) $2^{50} \cdot I_2$ D) $2^{75} \cdot I_2$ E) $2^{100} \cdot I_2$

6. $A = \begin{bmatrix} 3 & 5 \\ 4 & 7 \end{bmatrix}, \; A \cdot x = I_2 \Rightarrow \mathbf{x = ?}$

A) $\begin{bmatrix} -3 & 5 \\ 4 & -7 \end{bmatrix}$ B) $\begin{bmatrix} 7 & -5 \\ -4 & 3 \end{bmatrix}$ C) $\begin{bmatrix} -4 & 5 \\ 3 & -7 \end{bmatrix}$ D) $\begin{bmatrix} 5 & -4 \\ -7 & 3 \end{bmatrix}$ E) $\begin{bmatrix} 7 & -4 \\ -5 & 3 \end{bmatrix}$

7. $A=\begin{bmatrix}3 & 2\\ -1 & 4\end{bmatrix},\ B=\begin{bmatrix}12 & 1\\ 10 & -5\end{bmatrix},\ A\cdot x=B \Rightarrow \mathbf{x=?}$

A) $\begin{bmatrix}-2 & 1\\ -3 & 1\end{bmatrix}$ B) $\begin{bmatrix}2 & 1\\ 3 & -1\end{bmatrix}$ C) $\begin{bmatrix}2 & -1\\ -3 & 1\end{bmatrix}$

D) $\begin{bmatrix}1 & -1\\ 3 & 2\end{bmatrix}$ E) $\begin{bmatrix}3 & -2\\ 1 & -1\end{bmatrix}$

8. $A=\begin{bmatrix}3 & 2\\ 1 & 1\end{bmatrix},\ B=\begin{bmatrix}-1 & 4\\ 3 & 2\end{bmatrix} \Rightarrow \mathbf{B\cdot A^{-1}=?}$

A) $\begin{bmatrix}-5 & 14\\ 1 & 0\end{bmatrix}$ B) $\begin{bmatrix}-6 & 12\\ 2 & 3\end{bmatrix}$ C) $\begin{bmatrix}5 & -7\\ 13 & 0\end{bmatrix}$

D) $\begin{bmatrix}4 & -8\\ -2 & 0\end{bmatrix}$ E) $\begin{bmatrix}-3 & 15\\ -3 & 0\end{bmatrix}$

9. $A=\begin{bmatrix}-2 & 3 & 1\\ 0 & 4 & -1\\ 2 & 1 & 4\end{bmatrix} \Rightarrow \mathbf{|A|=?}$

A) –44 B) –46 C) –48

D) –50 E) –52

10. $\begin{vmatrix}x & 0 & 0\\ -1 & 3 & x\\ 2 & 4 & 0\end{vmatrix}=-100,\ x\in R^{+} \Rightarrow \mathbf{x=?}$

A) 5 B) 7 C) 9

D) 11 E) 13

11. $A=\begin{bmatrix}1 & -4\\ 0 & 1\end{bmatrix} \Rightarrow \mathbf{A^5=?}$

A) $\begin{bmatrix}-20 & 0\\ 0 & -20\end{bmatrix}$ B) $\begin{bmatrix}4^5 & 0\\ 0 & 4^5\end{bmatrix}$ C) $\begin{bmatrix}1 & -20\\ 0 & 1\end{bmatrix}$

D) $\begin{bmatrix}-20 & 0\\ 1 & -20\end{bmatrix}$ E) $\begin{bmatrix}-4^5 & 0\\ 0 & -4^5\end{bmatrix}$

12. $A=\begin{bmatrix}-2 & 1 & 3\\ 0 & -1 & 4\\ 1 & 2 & -3\end{bmatrix} \Rightarrow \mathbf{|A|=?}$

A) 13 B) 14 C) 16

D) 17 E) 19

YANITLAR / ANSWERS

1. C **2. A** **3. E** **4. D** **5. A** **6. B** **7. B** **8. A**
9. C **10. A** **11. C** **12. D**

1.

$$\left.\begin{array}{l} y = z-1 \\ 2x = 4y \\ z = 4 \end{array}\right\} \Rightarrow \begin{array}{l} y = 3, \\ x = 2y = 6 \\ z = 4 \end{array}$$

$$\Rightarrow x + y + z = 6 + 3 + 4 = 13$$

Yanıt / The Answer is C

2.

$$\begin{bmatrix} 2 & -1 & 0 \\ 3 & 1 & 2 \end{bmatrix} \cdot \begin{bmatrix} 3 & 0 \\ -1 & 2 \\ 4 & 1 \end{bmatrix} = \begin{bmatrix} 7 & -2 \\ 16 & 4 \end{bmatrix}$$

Yanıt / The Answer is A

3.

$$A^T \cdot B = \begin{bmatrix} -2 & 4 \\ 1 & 2 \\ 3 & 1 \end{bmatrix} \cdot \begin{bmatrix} -1 & 2 \\ 3 & 1 \end{bmatrix} = \begin{bmatrix} 14 & 0 \\ 5 & 4 \\ 0 & 7 \end{bmatrix}$$

Yanıt / The Answer is E

4. $f(A) = A^2 - 3A + 5$

$$= \begin{bmatrix} -3 & 4 \\ 5 & 2 \end{bmatrix} \cdot \begin{bmatrix} -3 & 4 \\ 5 & 2 \end{bmatrix} - 3\begin{bmatrix} -3 & 4 \\ 5 & 2 \end{bmatrix} + 5I$$

$$= \begin{bmatrix} 29 & -4 \\ -5 & 24 \end{bmatrix} + \begin{bmatrix} 14 & -12 \\ -15 & -1 \end{bmatrix}$$

$$= \begin{bmatrix} 43 & -16 \\ -20 & 23 \end{bmatrix}$$

Yanıt / The Answer is D

5.

$$A^2 = \begin{bmatrix} 1 & 4 \\ 0 & -1 \end{bmatrix} \cdot \begin{bmatrix} 1 & 4 \\ 0 & -1 \end{bmatrix} = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix} = I_2$$

$$A^{50} = (I_2)^{25} = I_2$$

Yanıt / The Answer is A

6. $A \cdot x = I_2 \Rightarrow$

$$x = A^{-1} \cdot I_2 = A^{-1} = \frac{1}{3 \cdot 7 - 5 \cdot 4} \begin{bmatrix} 7 & -5 \\ -4 & 3 \end{bmatrix}$$

$$= \begin{bmatrix} 7 & -5 \\ -4 & 3 \end{bmatrix}$$

Yanıt / The Answer is B

7. $A \cdot x = B \Rightarrow x = A^{-1}B$

$$A^{-1} = \frac{1}{12+2}\begin{bmatrix} 4 & -2 \\ 1 & 3 \end{bmatrix} = \frac{1}{14}\begin{bmatrix} 4 & -2 \\ 1 & 3 \end{bmatrix}$$

$$A^{-1}B = \frac{1}{14}\begin{bmatrix} 4 & -2 \\ 1 & 3 \end{bmatrix} \cdot \begin{bmatrix} 12 & 1 \\ 10 & -5 \end{bmatrix}$$

$$= \frac{1}{14}\begin{bmatrix} 28 & 14 \\ 42 & -14 \end{bmatrix} = \begin{bmatrix} 2 & 1 \\ 3 & -1 \end{bmatrix}$$

Yanıt / The Answer is B

8. $$B \cdot A^{-1} = \begin{bmatrix} -1 & 4 \\ 3 & 2 \end{bmatrix} \cdot \begin{bmatrix} 1 & -2 \\ -1 & 3 \end{bmatrix} = \begin{bmatrix} -5 & 14 \\ 1 & 0 \end{bmatrix}$$

Yanıt / The Answer is A

9.

$$\begin{array}{r|rrr|r} & -2 & 3 & 1 & \\ & 0 & 4 & -1 & \\ 8 & 2 & 1 & 4 & -32 \\ 2 & -2 & 3 & 1 & 0 \\ \underline{0} & 0 & 4 & -1 & \underline{-6} \\ 10 & & & & -38 \end{array}$$

$\Rightarrow |A| = -48$

Yanıt / The Answer is C

10. $$(-1)^{1+1}x\begin{vmatrix} 3 & x \\ 4 & 0 \end{vmatrix} = -100$$

$$-x \cdot 4x = -100$$

$$x^2 = 25$$

$$x = 5$$

Yanıt / The Answer is A

11. $$A^2 = \begin{bmatrix} 1 & -4 \\ 0 & 1 \end{bmatrix} \cdot \begin{bmatrix} 1 & -4 \\ 0 & 1 \end{bmatrix} = \begin{bmatrix} 1 & -8 \\ 0 & 1 \end{bmatrix}$$

$$\Rightarrow A^5 = \begin{bmatrix} 1 & -20 \\ 0 & 1 \end{bmatrix}$$

Yanıt / The Answer is C

12.

$$\begin{array}{r|rrr|r} & -2 & 1 & 3 & \\ & 0 & -1 & 4 & \\ -3 & 1 & 2 & -3 & -6 \\ -16 & 1 & 1 & 3 & 0 \\ \underline{0} & 0 & -1 & 4 & \underline{4} \\ -19 & & & & -2 \end{array}$$

$\Rightarrow |A| = -2 + 19 = 17$

Yanıt / The Answer is D

1. $\begin{bmatrix}-2 & x & 4\end{bmatrix}\cdot\begin{bmatrix}0 & 3\\ 1 & y\\ 2 & 1\end{bmatrix}=\begin{bmatrix}9 & 3\end{bmatrix} \Rightarrow \mathbf{x+y=?}$

A) 4
B) 6
C) 8
D) 10
E) 12

2. $A=\begin{bmatrix}2 & 1 & -1\\ 3 & 2 & 4\end{bmatrix},\ B=\begin{bmatrix}-1 & 3\\ 2 & 4\end{bmatrix} \Rightarrow \mathbf{A^T\cdot B=?}$

A) $\begin{bmatrix}1 & -3\\ 4 & 12\\ 7 & 15\end{bmatrix}$
B) $\begin{bmatrix}-2 & 5\\ 7 & 12\\ 8 & 10\end{bmatrix}$
C) $\begin{bmatrix}4 & 18\\ 3 & 11\\ 9 & 13\end{bmatrix}$
D) $\begin{bmatrix}3 & 20\\ 2 & 9\\ 11 & 15\end{bmatrix}$
E) $\begin{bmatrix}4 & 15\\ 1 & 16\\ 8 & 7\end{bmatrix}$

3. $\begin{bmatrix}-2 & 3 & 4\\ 1 & -1 & 0\end{bmatrix}\cdot\begin{bmatrix}-3 & 1\\ 4 & 2\\ 0 & 1\end{bmatrix}=?$

A) $\begin{bmatrix}18 & 8\\ -7 & -1\end{bmatrix}$
B) $\begin{bmatrix}16 & -5\\ -5 & -3\end{bmatrix}$
C) $\begin{bmatrix}12 & 4\\ -3 & -5\end{bmatrix}$
D) $\begin{bmatrix}20 & 18\\ -7 & -9\end{bmatrix}$
E) $\begin{bmatrix}16 & 8\\ -7 & 5\end{bmatrix}$

4. $A=\begin{bmatrix}-3 & 4\\ 2 & 1\end{bmatrix} \Rightarrow \mathbf{2\cdot A+A^T=?}$

A) $\begin{bmatrix}-11 & 4\\ 10 & 3\end{bmatrix}$
B) $\begin{bmatrix}-12 & 9\\ 8 & 5\end{bmatrix}$
C) $\begin{bmatrix}-6 & 8\\ 7 & 6\end{bmatrix}$
D) $\begin{bmatrix}-9 & 10\\ 8 & 3\end{bmatrix}$
E) $\begin{bmatrix}-10 & 5\\ 7 & 4\end{bmatrix}$

5. $A=\begin{bmatrix}3 & 13\\ 1 & 4\end{bmatrix} \Rightarrow \mathbf{A^{-1}=?}$

A) $\begin{bmatrix}-3 & 1\\ 13 & -4\end{bmatrix}$
B) $\begin{bmatrix}-13 & 4\\ 1 & -3\end{bmatrix}$
C) $\begin{bmatrix}3 & -4\\ 13 & -1\end{bmatrix}$
D) $\begin{bmatrix}4 & 13\\ 1 & 3\end{bmatrix}$
E) $\begin{bmatrix}-4 & 13\\ 1 & -3\end{bmatrix}$

6. $A=\begin{bmatrix}-3 & 4\\ 1 & -1\end{bmatrix} \Rightarrow \mathbf{A^2+A=?}$

A) $\begin{bmatrix}11 & -6\\ -4 & 5\end{bmatrix}$
B) $\begin{bmatrix}8 & -7\\ -1 & 5\end{bmatrix}$
C) $\begin{bmatrix}10 & -12\\ -3 & 4\end{bmatrix}$
D) $\begin{bmatrix}9 & -5\\ -6 & 7\end{bmatrix}$
E) $\begin{bmatrix}10 & -9\\ -2 & 6\end{bmatrix}$

7. $\begin{vmatrix} x-1 & x \\ -2 & 3 \end{vmatrix} = 32 \Rightarrow \mathbf{x = ?}$

A) 5 B) 6 C) 7 D) 8 E) 9

8. $\begin{vmatrix} x & -2 & 1 \\ 3 & -1 & x \\ 4 & 0 & 2 \end{vmatrix} = -24 \Rightarrow \mathbf{x = ?}$

A) 4 B) 5 C) 6 D) 7 E) 8

9. $A = \begin{bmatrix} 1 & -4 \\ 0 & 1 \end{bmatrix} \Rightarrow \mathbf{A^{15}} = \mathbf{?}$

A) $\begin{bmatrix} 1 & -48 \\ 0 & 1 \end{bmatrix}$ B) $\begin{bmatrix} 1 & -54 \\ 0 & 1 \end{bmatrix}$ C) $\begin{bmatrix} 1 & -60 \\ 0 & 1 \end{bmatrix}$ D) $\begin{bmatrix} 1 & -80 \\ 0 & 1 \end{bmatrix}$ E) $\begin{bmatrix} 1 & -100 \\ 0 & 1 \end{bmatrix}$

10. $\begin{vmatrix} \mathbf{2007} & \mathbf{2006} \\ \mathbf{2008} & \mathbf{2005} \end{vmatrix} = \mathbf{?}$

A) –4013 B) 1 C) 2008 D) 4013 E) 40113

11. $A = \begin{bmatrix} 3 & 8 \\ -2 & 5 \end{bmatrix} \Rightarrow \left|\mathbf{A^T}\right| = \mathbf{?}$

A) 28 B) 29 C) 30 D) 31 E) 32

12. $A = \begin{bmatrix} 3 & -2 \\ 4 & 6 \end{bmatrix}, B = \begin{bmatrix} 3 & x \\ 2 & 10 \end{bmatrix}$

$|A| = |B| \Rightarrow \mathbf{x = ?}$

A) –2 B) 0 C) 2 D) 4 E) 6

YANITLAR / ANSWERS

1. B 2. C 3. A 4. D 5. E 6. C 7. C 8. A

9. C 10. A 11. D 12. C

1. $-2\cdot 0 + x\cdot 1 + 4\cdot 2 = 9$

$x = 1$

$(-2)\cdot 3 + x\cdot y + 4\cdot 1 = 3$

$-2 + y = 3 \Rightarrow y = 5$

$\Rightarrow x + y = 6$

Yanıt / The Answer is B

2. $A^T \cdot B = \begin{bmatrix} 2 & 3 \\ 1 & 2 \\ -1 & 4 \end{bmatrix} \cdot \begin{bmatrix} -1 & 3 \\ 2 & 4 \end{bmatrix} = \begin{bmatrix} 4 & 18 \\ 3 & 11 \\ 9 & 13 \end{bmatrix}$

Yanıt / The Answer is C

3. $\begin{bmatrix} -2 & 3 & 4 \\ 1 & -1 & 0 \end{bmatrix} \cdot \begin{bmatrix} -3 & 1 \\ 4 & 2 \\ 0 & 1 \end{bmatrix} = \begin{bmatrix} 18 & 8 \\ -7 & -1 \end{bmatrix}$

Yanıt / The Answer is A

4. $2A + A^T = \begin{bmatrix} -6 & 8 \\ 4 & 2 \end{bmatrix} + \begin{bmatrix} -3 & 2 \\ 4 & 1 \end{bmatrix} = \begin{bmatrix} -9 & 10 \\ 8 & 3 \end{bmatrix}$

Yanıt / The Answer is D

5. $|A| = 12 - 13 = -1$

$A^{-1} = -\begin{bmatrix} 4 & -13 \\ -1 & 3 \end{bmatrix} = \begin{bmatrix} -4 & 13 \\ 1 & -3 \end{bmatrix}$

Yanıt / The Answer is E

6. $A^2 + A = \begin{bmatrix} -3 & 4 \\ 1 & -1 \end{bmatrix} \cdot \begin{bmatrix} -3 & 4 \\ 1 & -1 \end{bmatrix} + \begin{bmatrix} -3 & 4 \\ 1 & -1 \end{bmatrix}$

$= \begin{bmatrix} 10 & -12 \\ -3 & 4 \end{bmatrix}$

Yanıt / The Answer is C

7. $(x-1)\cdot 3 + 2x = 32$

$5x = 35$

$x = 7$

Yanıt / The Answer is C

8. $$\begin{array}{r|ccc|r} & x & -2 & 1 & \\ & 3 & -1 & x & \\ -4 & 4 & 0 & 2 & -2x \\ 0 & x & -2 & 1 & 0 \\ -12 & 3 & -1 & x & -8x \\ \hline -16 & & & & -10x \end{array}$$

$-10x + 16 = -24$

$x = 4$

Yanıt / The Answer is A

9. $A^2 = \begin{bmatrix} 1 & -4 \\ 0 & 1 \end{bmatrix} \cdot \begin{bmatrix} 1 & -4 \\ 0 & 1 \end{bmatrix} = \begin{bmatrix} 1 & -8 \\ 0 & 1 \end{bmatrix}$

$\Rightarrow A^{15} = \begin{bmatrix} 1 & -60 \\ 0 & 1 \end{bmatrix}$

Yanıt / The Answer is C

10. $\begin{vmatrix} 2007 & 2006 \\ 2008 & 2005 \end{vmatrix} = 2007 \cdot 2005 - 2008 \cdot 2006$

$2007 = t \Rightarrow t(t-2) - (t+1)(t-1)$

$= t^2 - 2t - t^2 + 1$

$= 1 - 2\cdot 2007$

$= -4013$

Yanıt / The Answer is A

11. $|A^T| = |A| = 3\cdot 5 - (-2)\cdot 8 = 31$

Yanıt / The Answer is D

12. $|A| = 18 + 8 = 26$

$|B| = 30 - 2x$

$30 - 2x = 26$

$x = 2$

Yanıt / The Answer is C

1. $A=\begin{bmatrix} 3 & x \\ z & y \end{bmatrix}$ $B=\begin{bmatrix} 3 & -2 \\ x+1 & 3z \end{bmatrix}$

$A=B \Rightarrow \mathbf{x+y+z=?}$

Yanıt / The Answer is: **–6**

2. $\begin{bmatrix} -2 & 3 \\ 4 & 5 \end{bmatrix} \cdot \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 14 \\ 16 \end{bmatrix} \Rightarrow \mathbf{x+y=?}$

Yanıt / The Answer is: **3**

3. $A=\begin{bmatrix} -3 & 2 \\ 5 & -1 \end{bmatrix}$ $B=\begin{bmatrix} -2 & 5 \\ 4 & 0 \end{bmatrix}$

$3A-2B=C \Rightarrow \mathbf{C=?}$

Yanıt / The Answer is: $\begin{bmatrix} \mathbf{-5} & \mathbf{-4} \\ \mathbf{7} & \mathbf{-3} \end{bmatrix}$

4. $A=\begin{bmatrix} 3 & -1 \\ -5 & 2 \end{bmatrix} \Rightarrow \mathbf{A^{-1}=?}$

Yanıt / The Answer is: $\begin{bmatrix} \mathbf{2} & \mathbf{1} \\ \mathbf{5} & \mathbf{3} \end{bmatrix}$

5. $A=\begin{bmatrix} -2 & 3 & 1 \\ 2 & 5 & -3 \end{bmatrix}, B=\begin{bmatrix} -1 & 4 & -1 \\ 2 & -2 & 1 \end{bmatrix} \Rightarrow \mathbf{A \cdot B^{T}=?}$

Yanıt / The Answer is: $\begin{bmatrix} \mathbf{13} & \mathbf{-9} \\ \mathbf{21} & \mathbf{-9} \end{bmatrix}$

6. $A=\begin{bmatrix} -3 & 1 \\ 4 & 2 \end{bmatrix}, \ f(x)=x^2+5x-2 \Rightarrow \mathbf{f(A)=?}$

Yanıt / The Answer is: $\begin{bmatrix} \mathbf{-4} & \mathbf{4} \\ \mathbf{16} & \mathbf{16} \end{bmatrix}$

7. $A=\begin{bmatrix} 3 & 0 \\ -1 & \frac{1}{3} \end{bmatrix} \Rightarrow \mathbf{A^{-1}=?}$

Yanıt / The Answer is: $\begin{bmatrix} \mathbf{1/3} & \mathbf{0} \\ \mathbf{1} & \mathbf{3} \end{bmatrix}$

8. $A=\begin{bmatrix} 3 & 5 \\ 1 & 2 \end{bmatrix} \Rightarrow \mathbf{A^{-1}=?}$

Yanıt / The Answer is: $\begin{bmatrix} \mathbf{2} & \mathbf{-5} \\ \mathbf{-1} & \mathbf{3} \end{bmatrix}$

9. $\begin{vmatrix} x & 2 \\ x-3 & 4 \end{vmatrix} = -2 \Rightarrow \mathbf{x=?}$

Yanıt / The Answer is: **–4**

10. $A=\begin{bmatrix} -1 & 3 & 2 \\ 4 & 7 & 1 \\ 2 & 2 & -2 \end{bmatrix} \Rightarrow \mathbf{|A|=?}$

Yanıt / The Answer is: **34**

11. $A=\begin{bmatrix} 3 & 2 \\ -1 & 2 \end{bmatrix} \Rightarrow \mathbf{|A^2|=?}$

Yanıt / The Answer is: **64**

12. $A=\begin{bmatrix} 1001 & 1000 \\ 1000 & 1001 \end{bmatrix} \Rightarrow \mathbf{\det A\ =?}$

Yanıt / The Answer is: **2001**

1. $\begin{bmatrix} -2 & 1 & 3 \\ -1 & 4 & 2 \end{bmatrix} \cdot \begin{bmatrix} 1 & 2 \\ 0 & -1 \\ -1 & 2 \end{bmatrix} \cdot \begin{bmatrix} -2 & 1 \\ 3 & -1 \end{bmatrix} = ?$

A) $\begin{bmatrix} 13 & -6 \\ 0 & -1 \end{bmatrix}$ B) $\begin{bmatrix} 12 & -5 \\ 1 & -1 \end{bmatrix}$ C) $\begin{bmatrix} 14 & -3 \\ -3 & 4 \end{bmatrix}$

D) $\begin{bmatrix} 15 & -2 \\ -4 & 5 \end{bmatrix}$ E) $\begin{bmatrix} 12 & -4 \\ -2 & 6 \end{bmatrix}$

2. $A = \begin{bmatrix} -1 & 2 & 1 \\ 0 & -2 & 3 \end{bmatrix}, \quad B = \begin{bmatrix} x \\ y \\ 1 \end{bmatrix}, \quad C = \begin{bmatrix} 9 \\ -3 \end{bmatrix}$

$A \cdot B = C \Rightarrow x - y = ?$

A) –7 B) –5 C) 1

D) 8 E) 12

3. $A = \begin{bmatrix} -3 & x \\ 4 & y \end{bmatrix}, \quad A^2 = \begin{bmatrix} 5 & 1 \\ -4 & 0 \end{bmatrix} \Rightarrow x + y = ?$

A) –3 B) –2 C) –1

D) 0 E) 1

4. $A = \begin{bmatrix} 1 & -1 \\ 1 & 1 \end{bmatrix}, \quad B = \begin{bmatrix} 2 & -2 \\ 2 & 2 \end{bmatrix} \Rightarrow (B \cdot A)^{-1} = ?$

A) $\begin{bmatrix} 0 & \frac{1}{4} \\ -\frac{1}{4} & 0 \end{bmatrix}$ B) $\begin{bmatrix} 0 & \frac{1}{16} \\ \frac{1}{16} & 0 \end{bmatrix}$ C) $\begin{bmatrix} 0 & -\frac{1}{2} \\ \frac{1}{2} & 0 \end{bmatrix}$

D) $\begin{bmatrix} 0 & -\frac{1}{4} \\ -\frac{1}{4} & 0 \end{bmatrix}$ E) $\begin{bmatrix} 0 & -\frac{1}{4} \\ \frac{1}{4} & 0 \end{bmatrix}$

5. $\begin{bmatrix} 3 & 1 \\ 4 & 2 \end{bmatrix} + \begin{bmatrix} 5 & 7 \\ 0 & 2 \end{bmatrix} = 4x \Rightarrow x = ?$

A) $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ B) $\begin{bmatrix} 2 & 2 \\ 1 & 1 \end{bmatrix}$ C) $2\begin{bmatrix} 1 & 1 \\ 1 & 1 \end{bmatrix}$

D) $2\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ E) $\begin{bmatrix} 1 & 1 \\ 2 & 2 \end{bmatrix}$

6. $A = \begin{bmatrix} 0 & -1 & 3 \\ 1 & 2 & 0 \end{bmatrix}, \quad B = [1 \; -1 \; 3] \Rightarrow A \cdot B^T = ?$

A) $\begin{bmatrix} 10 \\ -1 \end{bmatrix}$ B) $\begin{bmatrix} 10 \\ -2 \end{bmatrix}$ C) $\begin{bmatrix} 10 \\ 2 \end{bmatrix}$

D) $\begin{bmatrix} -10 \\ 2 \end{bmatrix}$ E) $\begin{bmatrix} -10 \\ -2 \end{bmatrix}$

7. $A=\begin{bmatrix}1 & 2\\ 3 & 4\end{bmatrix},\ B=\begin{bmatrix}-1 & 1 & 2\\ 3 & 4 & 5\end{bmatrix},\ C=\begin{bmatrix}0 & 1 & 2\\ -1 & 1 & 3\end{bmatrix}$

$\Rightarrow$ **A·B + C = ?**

A) $\begin{bmatrix}8 & 10 & 14\\ 5 & 20 & 19\end{bmatrix}$ B) $\begin{bmatrix}5 & 8 & 14\\ 8 & 20 & 29\end{bmatrix}$

C) $\begin{bmatrix}5 & 10 & 14\\ 8 & 20 & 29\end{bmatrix}$ D) $\begin{bmatrix}8 & 20 & 29\\ 5 & 10 & 14\end{bmatrix}$

E) $\begin{bmatrix}5 & 14 & 10\\ 8 & 20 & 29\end{bmatrix}$

8. $A=\begin{bmatrix}-2 & 3 & 0\\ -1 & 4 & 5\end{bmatrix},\ C=\begin{bmatrix}-5 & 4 & 1\\ 7 & -1 & 5\end{bmatrix}$

$2A-B=3C \Rightarrow$ **B = ?**

A) $\begin{bmatrix}12 & 14 & -16\\ 13 & -7 & 8\end{bmatrix}$ B) $\begin{bmatrix}13 & -7 & -5\\ 15 & 12 & -7\end{bmatrix}$

C) $\begin{bmatrix}12 & -5 & 4\\ -12 & 16 & 7\end{bmatrix}$ D) $\begin{bmatrix}11 & -6 & -3\\ -23 & 11 & -5\end{bmatrix}$

E) $\begin{bmatrix}13 & 7 & -2\\ -12 & 15 & 3\end{bmatrix}$

9. $\begin{bmatrix}x+1 & -1\\ 3y & 2\end{bmatrix}\cdot\begin{bmatrix}-2\\ 1\end{bmatrix}=\begin{bmatrix}x\\ 8\end{bmatrix} \Rightarrow$ **x + y = ?**

A) –2 B) –3 C) –4

D) –5 E) –6

10. $A=\begin{bmatrix}-2 & 1\\ 3 & 0\end{bmatrix},\ B=\begin{bmatrix}x & -2\\ 4 & 1\end{bmatrix}$

$|A|+|B|=10 \Rightarrow$ **x = ?**

A) 5 B) 6 C) 7

D) 8 E) 9

11. $A=\begin{bmatrix}-2 & 3\\ 4 & 1\end{bmatrix},\ B=\begin{bmatrix}1 & 4\\ 5 & 2\end{bmatrix} \Rightarrow$ **|A·B| = ?**

A) 250 B) 252 C) 254

D) 256 E) 258

12. $x \in (0, \pi)$,

$\begin{vmatrix}\cos 2x & \sin 2x\\ \sin x & \cos x\end{vmatrix} = -\frac{1}{2} \Rightarrow$ **x = ?**

A) 30° B) 40° C) 60°

D) 120° E) 150°

YANITLAR / ANSWERS

1. A	**2. B**	**3. E**	**4. A**	**5. B**	**6. A**	**7. C**	**8. D**
9. A	**10. A**	**11. B**	**12. B**				

1. $A=\begin{bmatrix}1 & 2 & 3\\ -1 & 0 & 4\end{bmatrix},\quad B=\begin{bmatrix}-1 & -2 & 1\\ 2 & -3 & 4\end{bmatrix}$

$\Rightarrow \mathbf{A+B=?}$

A) $\begin{bmatrix}0 & 0 & 2\\ 1 & 0 & 3\end{bmatrix}$ B) $\begin{bmatrix}0 & 0 & 4\\ 1 & -3 & 8\end{bmatrix}$

C) $\begin{bmatrix}0 & 0 & 1\\ 1 & 1 & 8\end{bmatrix}$ D) $\begin{bmatrix}0 & -4 & 3\\ -1 & -9 & 16\end{bmatrix}$

E) $\begin{bmatrix}1 & 1 & 0\\ 0 & 0 & 4\end{bmatrix}$

2. $A=\begin{bmatrix}1 & 2 & 3\\ 3 & -1 & 2\end{bmatrix}\Rightarrow \mathbf{A^T=?}$

A) $\begin{bmatrix}1 & 3\\ 2 & -1\\ 3 & 2\end{bmatrix}$ B) $\begin{bmatrix}1 & 3\\ 2 & -1\\ 2 & 3\end{bmatrix}$ C) $\begin{bmatrix}3 & -1 & 2\\ 1 & 2 & 3\end{bmatrix}$

D) $\begin{bmatrix}1 & 3\\ 2 & 1\\ 3 & 2\end{bmatrix}$ E) $\begin{bmatrix}3 & 1\\ -1 & 2\\ 2 & 3\end{bmatrix}$

3. $A=\begin{bmatrix}5 & 4\\ 6 & 5\end{bmatrix},\quad A^T\cdot B=\begin{bmatrix}1 & 0\\ 0 & 1\end{bmatrix}\Rightarrow \mathbf{B=?}$

A) $\begin{bmatrix}5 & -6\\ -4 & 5\end{bmatrix}$ B) $\begin{bmatrix}5 & 6\\ 4 & 5\end{bmatrix}$ C) $\begin{bmatrix}5 & -4\\ -6 & 5\end{bmatrix}$

D) $\begin{bmatrix}5 & 4\\ 6 & 5\end{bmatrix}$ E) $\begin{bmatrix}-5 & -6\\ -4 & 5\end{bmatrix}$

4. $A-3\cdot\begin{bmatrix}4 & 2\\ -1 & 3\end{bmatrix}+4=0\Rightarrow \mathbf{A=?}$

A) $\begin{bmatrix}16 & 6\\ -3 & 13\end{bmatrix}$ B) $\begin{bmatrix}8 & 6\\ -3 & 5\end{bmatrix}$ C) $\begin{bmatrix}-3 & 6\\ 13 & 16\end{bmatrix}$

D) $\begin{bmatrix}13 & 16\\ -3 & 6\end{bmatrix}$ E) $\begin{bmatrix}-3 & 16\\ 13 & 6\end{bmatrix}$

5. $A=\begin{bmatrix}\cos\alpha & -\sin\alpha\\ \sin\alpha & \cos\alpha\end{bmatrix}\Rightarrow \mathbf{|A|=?}$

A) $\cos 2\alpha$ B) $\sin 2\alpha$ C) 1

D) $-\cos 2\alpha$ E) $-\sin 2\alpha$

6. $A=\begin{bmatrix}3 & 1\\ 11 & 4\end{bmatrix}\quad B=\begin{bmatrix}-2 & 1\\ 4 & 5\end{bmatrix}$

$A\cdot x=B\Rightarrow \mathbf{x=?}$

A) $\begin{bmatrix}-12 & -1\\ 34 & 4\end{bmatrix}$ B) $\begin{bmatrix}-17 & 3\\ -13 & 5\end{bmatrix}$ C) $\begin{bmatrix}21 & -2\\ 15 & 8\end{bmatrix}$

D) $\begin{bmatrix}-12 & 4\\ 8 & -6\end{bmatrix}$ E) $\begin{bmatrix}-21 & 7\\ 33 & 13\end{bmatrix}$

7. $A=\begin{bmatrix}-4 & 2\\ 4 & 1\end{bmatrix}$, $B=\begin{bmatrix}-10\\ 13\end{bmatrix}$, $A\cdot x=B \Rightarrow$ **x = ?**

A) $\begin{bmatrix}5\\ 2\end{bmatrix}$ B) $\begin{bmatrix}3\\ 1\end{bmatrix}$ C) $\begin{bmatrix}4\\ -2\end{bmatrix}$

D) $\begin{bmatrix}7\\ -3\end{bmatrix}$ E) $\begin{bmatrix}-3\\ 2\end{bmatrix}$

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8. $\begin{vmatrix}1 & -2 & 3\\ 4 & 2 & 0\\ -1 & 1 & 3\end{vmatrix}=?$

A) 36 B) 38 C) 40

D) 46 E) 48

---

9. $A=\begin{bmatrix}-1 & 1\\ -3 & -1\end{bmatrix} \Rightarrow A^{99}=?$

A) $2^{99}\cdot I_2$ B) $3^{99}\cdot I_2$ C) $4^{99}\cdot I_2$

D) $5^{99}\cdot I_2$ E) $6^{99}\cdot I_2$

---

10. $\begin{vmatrix}3 & 5\\ -2 & |x-1|\end{vmatrix}=19 \Rightarrow \sum x=?$

A) 1 B) 2 C) 4

D) 8 E) 10

---

11. $\begin{bmatrix}-2 & 1 & 3\\ 4 & -1 & 0\end{bmatrix}\cdot\begin{bmatrix}1 & 0\\ -1 & 1\\ 2 & 2\end{bmatrix}\cdot\begin{bmatrix}-1 & 3\\ 1 & 4\end{bmatrix}=?$

A) $\begin{bmatrix}-8 & -9\\ 10 & -7\end{bmatrix}$ B) $\begin{bmatrix}-7 & -12\\ -5 & 10\end{bmatrix}$ C) $\begin{bmatrix}4 & 37\\ -6 & 11\end{bmatrix}$

D) $\begin{bmatrix}-6 & -12\\ -14 & 8\end{bmatrix}$ E) $\begin{bmatrix}-10 & -6\\ -12 & 14\end{bmatrix}$

---

12. $A=\begin{bmatrix}-\sin\alpha & \cos\alpha\\ \cos\alpha & \sin\alpha\end{bmatrix} \Rightarrow A^{-1}=?$

A) $\begin{bmatrix}-\sin\alpha & \cos\alpha\\ \cos\alpha & \sin\alpha\end{bmatrix}$ B) $\begin{bmatrix}-\sin\alpha & -\cos\alpha\\ -\cos\alpha & \sin\alpha\end{bmatrix}$

C) $\begin{bmatrix}\sin\alpha & \cos\alpha\\ \cos\alpha & -\sin\alpha\end{bmatrix}$ D) $\begin{bmatrix}\cos\alpha & \sin\alpha\\ -\sin\alpha & \cos\alpha\end{bmatrix}$

E) $\begin{bmatrix}-\cos\alpha & \sin\alpha\\ -\sin\alpha & -\cos\alpha\end{bmatrix}$

YANITLAR / ANSWERS

1. B	**2. A**	**3. A**	**4. B**	**5. C**	**6. A**	**7. B**	**8. E**
9. A	**10. B**	**11. C**	**12. A**				

1. $A=\begin{bmatrix}2&3&-4\\1&2&3\end{bmatrix},\ B=\begin{bmatrix}-1&2&5\\0&1&-4\end{bmatrix}$

$\Rightarrow$ **A + B = ?**

A) $\begin{bmatrix}3&1&-9\\1&1&7\end{bmatrix}$ B) $\begin{bmatrix}1&5&1\\1&3&-1\end{bmatrix}$ C) $\begin{bmatrix}-2&6&-20\\0&2&-12\end{bmatrix}$

D) $\begin{bmatrix}-2&-\frac{3}{2}&1\\1&2&-\frac{4}{3}\end{bmatrix}$ E) $\begin{bmatrix}1&4&1\\1&2&1\end{bmatrix}$

2. $A=\begin{bmatrix}2&3x-1\\-4&5\end{bmatrix}\ B=\begin{bmatrix}4&-6\\1&4-y\end{bmatrix}\ C=\begin{bmatrix}6&2\\z+2&3\end{bmatrix}$

$A+B=C\Rightarrow$ **x + y + z = ?**

A) 10
B) 9
C) 8
D) 5
E) 4

3. $A=\begin{bmatrix}2&1&-2\\3&-1&4\end{bmatrix},\ B=\begin{bmatrix}1&0&4\\2&-1&1\\3&2&3\end{bmatrix}$

$\Rightarrow$ **A · B = ?**

A) $\begin{bmatrix}-2&-5&3\\13&9&23\end{bmatrix}$ B) $\begin{bmatrix}-2&13\\-5&9\\5&23\end{bmatrix}$ C) $\begin{bmatrix}-1&5&6\\9&7&12\end{bmatrix}$

D) $\begin{bmatrix}2&4&5\\7&6&-3\end{bmatrix}$ E) $\begin{bmatrix}-2&5&-5\\9&-13&20\end{bmatrix}$

4. $A=\begin{bmatrix}1&1\\0&1\end{bmatrix}\Rightarrow$ **A^{21} = ?**

A) $2^{20}\begin{bmatrix}1&0\\0&1\end{bmatrix}$ B) $-2^{20}\begin{bmatrix}1&0\\0&1\end{bmatrix}$ C) $\begin{bmatrix}1&18\\0&1\end{bmatrix}$

D) $\begin{bmatrix}1&21\\0&1\end{bmatrix}$ E) $\begin{bmatrix}1&1\\0&21\end{bmatrix}$

5. $A=\begin{bmatrix}2&1\\2&3\end{bmatrix}\Rightarrow$ **A^{-1} = ?**

A) $\frac{1}{2}\begin{bmatrix}-3&1\\2&-2\end{bmatrix}$ B) $\frac{1}{4}\begin{bmatrix}3&2\\1&2\end{bmatrix}$ C) $\frac{1}{4}\begin{bmatrix}3&-1\\-2&2\end{bmatrix}$

D) $\begin{bmatrix}3&-1\\-2&2\end{bmatrix}$ E) $\frac{1}{8}\begin{bmatrix}3&-1\\-2&2\end{bmatrix}$

6. $\begin{bmatrix}2&-1&3\\-1&3&2\\1&2&-1\end{bmatrix}-2A=\begin{bmatrix}2&3&1\\3&-1&2\\1&-2&1\end{bmatrix}\Rightarrow$ **A = ?**

A) $\begin{bmatrix}0&-2&1\\-2&2&0\\0&2&-1\end{bmatrix}$ B) $\begin{bmatrix}0&2&-1\\-1&1&-2\\0&-2&1\end{bmatrix}$ C) $\begin{bmatrix}1&2&0\\-2&2&0\\0&2&-1\end{bmatrix}$

D) $\begin{bmatrix}0&-2&0\\-2&2&2\\1&0&-1\end{bmatrix}$ E) $\begin{bmatrix}1&-2&-1\\-1&3&1\\0&2&-1\end{bmatrix}$

7. $A=\begin{bmatrix}1 & 3\\ 5 & 3\end{bmatrix}$

$f(x) = 2x^2 - 4x + 3 \Rightarrow$ **f(A) = ?**

A) $\begin{bmatrix}18 & 13\\ 10 & 29\end{bmatrix}$ B) $\begin{bmatrix}31 & 12\\ 20 & 39\end{bmatrix}$ C) $\begin{bmatrix}14 & 8\\ 12 & 16\end{bmatrix}$

D) $\begin{bmatrix}30 & 17\\ 10 & 13\end{bmatrix}$ E) $2\begin{bmatrix}31 & 12\\ 20 & 39\end{bmatrix}$

8. $A=\begin{bmatrix}2 & -1 & 3\\ 2 & -1 & 1\\ 1 & 3 & -2\end{bmatrix} \Rightarrow$ **IAI = ?**

A) 12
B) 13
C) 14
D) 16
E) 18

9. $\begin{vmatrix}\mathbf{3915} & \mathbf{3916}\\ \mathbf{3917} & \mathbf{3915}\end{vmatrix} = ?$

A) –11739
B) –11741
C) –11743
D) –11745
E) –11747

10. $\begin{vmatrix}x & 1 & 0\\ 2 & -1 & 3\\ 4 & -1 & -2\end{vmatrix} = 31 \Rightarrow$ **x = ?**

A) 7
B) 6
C) 5
D) 4
E) 3

11. $A=\begin{bmatrix}2 & 4\\ x & 7\end{bmatrix},\ A^{-1}=\begin{bmatrix}\frac{7}{2} & -2\\ -\frac{3}{2} & 1\end{bmatrix} \Rightarrow$ **x = ?**

A) $\frac{7}{2}$ B) 3 C) $\frac{5}{2}$

D) 2 E) $\frac{3}{2}$

12. $A=\begin{bmatrix}2 & 2\\ 3 & 4\end{bmatrix}, B=\begin{bmatrix}4 & -2\\ -3 & 2\end{bmatrix} \Rightarrow$ **$(A \cdot B)^{12}$ = ?**

A) $\begin{bmatrix}1 & 0\\ 0 & 1\end{bmatrix}$ B) $\frac{1}{64}\begin{bmatrix}1 & 0\\ 0 & 1\end{bmatrix}$ C) $2^8\begin{bmatrix}1 & 0\\ 1 & 1\end{bmatrix}$

D) $2^{12}\begin{bmatrix}1 & 0\\ 0 & 1\end{bmatrix}$ E) $2^{16}\begin{bmatrix}1 & 0\\ 1 & 1\end{bmatrix}$

YANITLAR / ANSWERS							
1. B	**2. E**	**3. A**	**4. D**	**5. C**	**6. A**	**7. B**	**8. C**
9. E	**10. E**	**11. B**	**12. D**				

1. $x \cdot \mathrm{sgn}x = x^2 - 6 \Rightarrow$ **ÇK(SS) = ?**

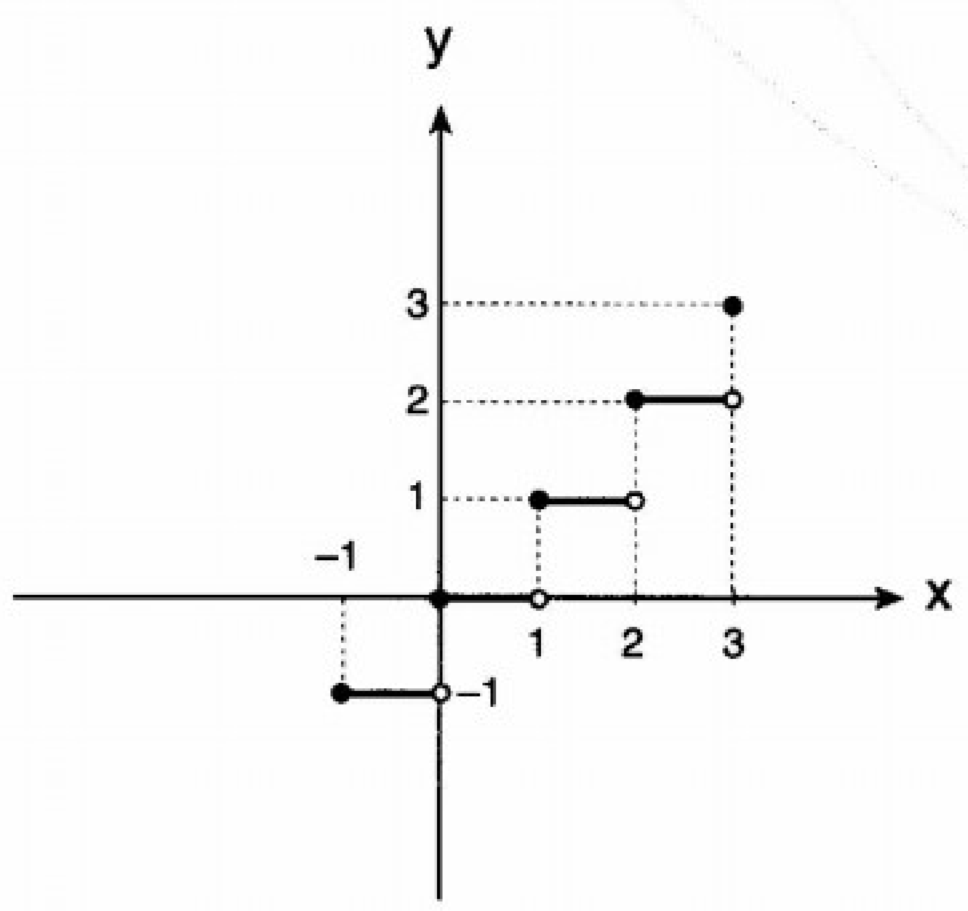
A) $\{0, 3\}$
B) $\{-3, 3\}$
C) $[-3, 3]$
D) $\{-3, 0\}$
E) $\varnothing$

2. $x \in Z$,

$\mathrm{sgn}(x^2 + 4) = [|x + 2|] \Rightarrow$ **x = ?**

A) -2
B) -1
C) 0
D) 1
E) 2

3.



f(x) = ?

A) $f : [-1, 3] \to R,\ f(x) = [|x|]$
B) $f : (-1, 3) \to R,\ f(x) = [|x|]$
C) $f : [-1, 3] \to R,\ f(x) = |x|$
D) $f : (-1, 3) \to R,\ f(x) = \mathrm{sgn}(x)$
E) $f : [-1, 3] \to R,\ f(x) = [|x + 1|]$

4. $[|3x - 6|] \le 2 \Rightarrow$ **ÇK(SS) = ?**

A) $(-2, 2)$
B) $(-\infty, 2]$
C) $(-\infty, 3)$
D) $(-3, 3)$
E) $(-\infty, 3]$

5. $[|2x - 8|] = 4 \Rightarrow$ **ÇK(SS) = ?**

A) $\{0, 1, 2, 3, 4\}$
B) $(-4, 4]$
C) $[6, 13/2)$
D) $(6, 7)$
E) $(-\infty, 4]$

6. $f(x) = \dfrac{6}{|2x - 1|}$ ise, $\mathbf{f(x)} > \dfrac{2}{3}$ **eşitsizliğini sağlayan tamsayıların toplamı kaçtır?**

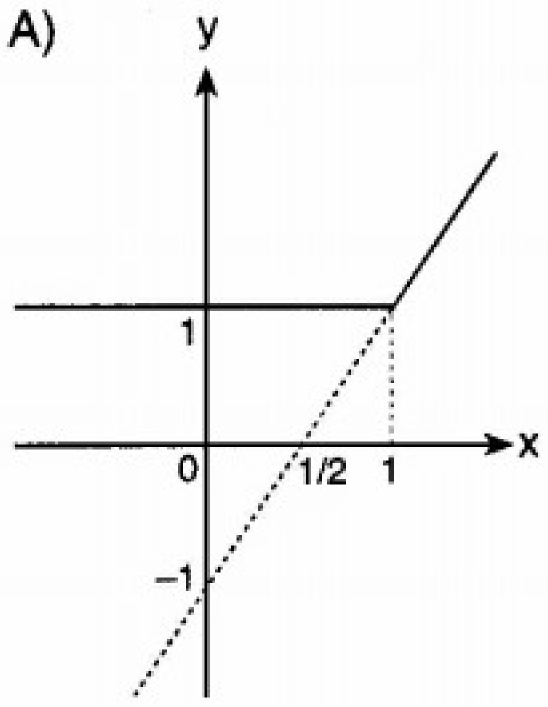
If $f(x) = \dfrac{6}{|2x - 1|}$, which of the following is the sum of the *integers that satisfies the inequality* $f(x) > \dfrac{2}{3}$?

A) -1
B) 0
C) 2
D) 4
E) 6

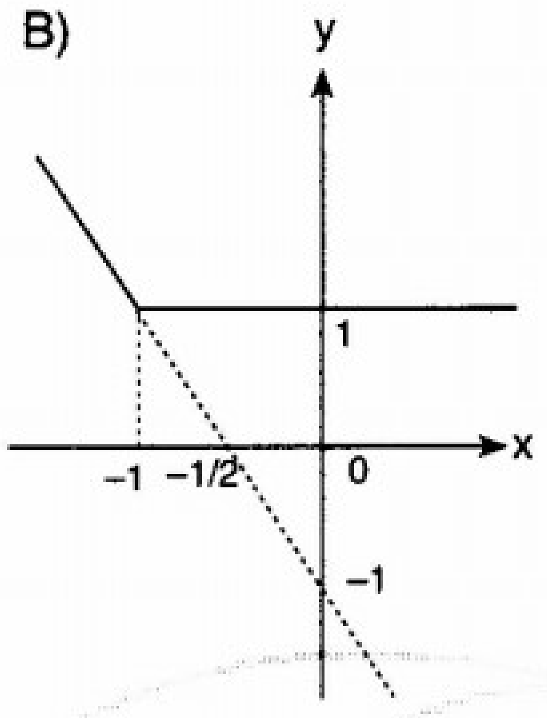
7. **$f(x) = x + |x - 1|$ fonksiyonunun grafiği aşağıdakilerden hangisidir?**

Which of the following is the graph of the function *$f(x) = x + |x - 1|$?*

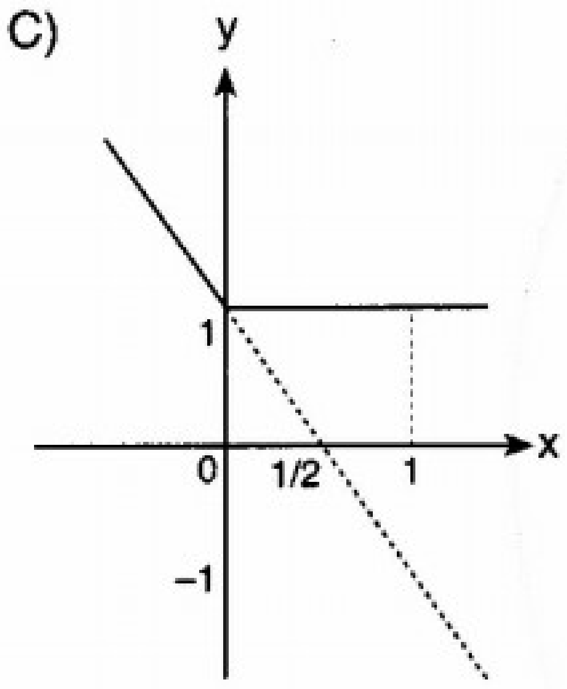
A)



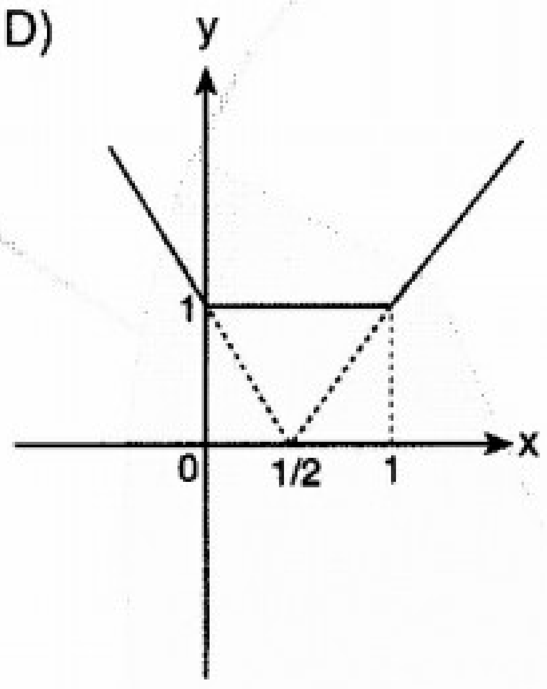
B)



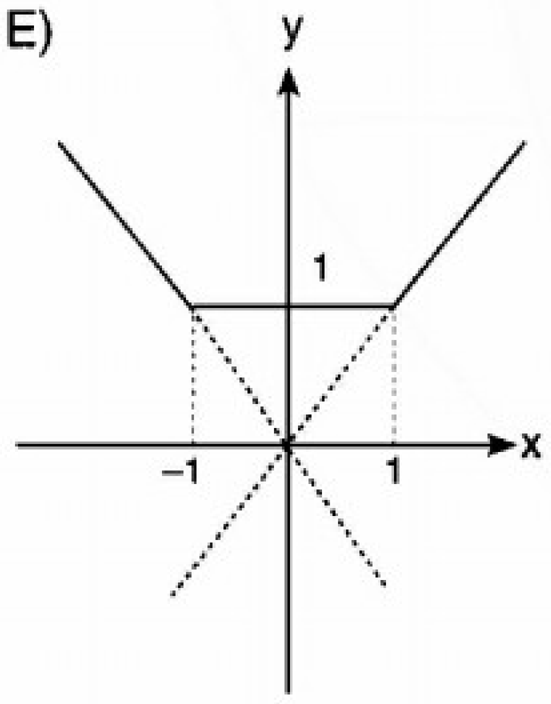
C)



D)



E)



8. $|5x - 3| < 17 \Rightarrow \sum x = ?$

A) 3 B) 2 C) 0

D) –2 E) –3

9. $f(x) = [\,|4x - 7|\,]$, $f(x) = 6 \Rightarrow$ **ÇK(SS) = ?**

A) $\left[3, \frac{13}{4}\right)$ B) $[5, 6)$ C) $(5,6)$

D) $\left(-\infty, \frac{3}{4}\right)$ E) $[3, 4)$

10. $f(x) = \big|\,[\,|x + 1|\,]\,\big|$,

$f(x) = 2 \Rightarrow$ **ÇK(SS) = ?**

A) $[2, 3) \cup [4, 6)$ B) $[-3, -2) \cup [1, 2)$

C) $[-3, -2) \cup [-1, 0)$ D) $[-2, -1) \cup [0, 1)$

E) $[2, 3) \cup [4, 5)$

11. $x^2 = \operatorname{sgn}(x) \Rightarrow \sum x = ?$

A) $\{-1, 0, 1\}$ B) $\{-1, 0\}$ C) $\{0, 1\}$

D) $\{0\}$ E) $\varnothing$

12. $f(x): A \rightarrow \{0, 1\}$

$f(x) = \operatorname{sgn}(x - 2) \Rightarrow$ **A = ?**

A) $\{0\} \cup (2, \infty)$ B) $\{2\}$ C) $(2, \infty)$

D) $[2, \infty)$ E) R

YANITLAR / ANSWERS							
1. B	**2. B**	**3. A**	**4. C**	**5. C**	**6. D**	**7. A**	**8. A**
9. A	**10. B**	**11. C**	**12. D**				

1. **i.** $x < 0 \Rightarrow \text{sgn}x = -1$

$x \cdot (-1) = x^2 - 6 \Rightarrow x^2 + x - 6 = 0$

$(x+3)(x-2) = 0$

$x = -3 \vee x = 2$

$x < 0 \Rightarrow x = -3$

ii. $x = 0 \Rightarrow 0 \cdot \text{sgn}0 = 0 - 6$

$0 \neq -6$

iii. $x > 0 \Rightarrow \text{sgn}x = 1$

$x = x^2 - 6 \Rightarrow x^2 - x - 6 = 0$

$(x+2)(x-3) = 0$

$x = -2 \vee x = 3$

$x > 0 \Rightarrow x = 3$

$\Rightarrow$ ÇK(SS) $= \{-3, 3\}$

Yanıt / The Answer is B

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2. $x^2 + 4 > 0 \Rightarrow \text{sgn}(x^2 + 4) = 1$

$[|\,x + 2\,|] = 1 \Rightarrow 1 \le x + 2 < 2$

$-1 \le x < 0$

$x \in Z \Rightarrow x = -1$

Yanıt / The Answer is B

---

3. $x \in [-1, 0) \Rightarrow [|\,x\,|] = -1$

$x \in [0, 1) \Rightarrow [|\,x\,|] = 0$

$x \in [1, 2) \Rightarrow [|\,x\,|] = 1$

$x \in [2, 3) \Rightarrow [|\,x\,|] = 2$

$x = 3 \Rightarrow [|\,x\,|] = 3$

Yanıt / The Answer is A

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4. $[|\,3x - 6\,|] \le 2 \Rightarrow 3x - 6 < 3$

$3x < 9$

$x < 3$

Yanıt / The Answer is C

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5. $[|\,2x - 8\,|] = 4 \Rightarrow 4 \le 2x - 8 < 5$

$12 \le 2x < 13$

$6 \le x < \frac{13}{2}$

Yanıt / The Answer is C

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6. $\frac{6}{|2x-1|} > \frac{2}{3} \Rightarrow \frac{|2x-1|}{6} < \frac{3}{2}$

$\Rightarrow |2x-1| < 9$

$\Rightarrow -9 < 2x - 1 < 9$

$\Rightarrow -8 < 2x < 10$

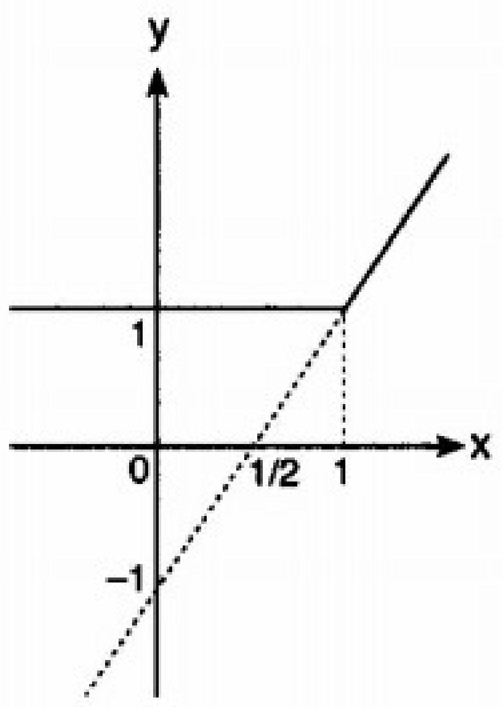
$\Rightarrow -4 < x < 5$

$\sum x = (-3) + (-2) + (-1) + 0 + 1 + 2 + 3 + 4 = 4$

Yanıt / The Answer is D

7.

$$f(x) = \begin{cases} |2x-1|, & x > 1 \\ 1, & x \leq 1 \end{cases} \Rightarrow$$



Yanıt / The Answer is A

8. $|5x-3| < 17 \Rightarrow -17 < 5x-3 < 17$

$-14 < 5x < 20$

$-\frac{14}{5} < x < 4$

$\sum x = (-2) + (-1) + 0 + 1 + 2 + 3 = 3$

Yanıt / The Answer is A

9. $5 \leq 4x - 7 < 6$

$12 \leq 4x < 13$

$3 \leq x < \frac{13}{4}$

$\Rightarrow \text{ÇK(SS)} = \left[3, \frac{13}{4}\right)$

Yanıt / The Answer is A

10. $f(x) = \left|\, [\![x+1]\!] \,\right| = 2$

$[\![x+1]\!] = 2 \quad \vee \quad [\![x+1]\!] = -2$

$2 \leq x+1 < 3 \qquad -2 \leq x+1 < -1$

$1 \leq x < 2 \qquad -3 \leq x < -2$

$\text{ÇK(SS)} = [-3, -2) \cup [1, 2)$

Yanıt / The Answer is B

11. $x > 0 \Rightarrow x^2 = 1$

$x = 1$

$x = 0 \Rightarrow x^2 = 0 \Rightarrow x = 0$

$x < 0 \Rightarrow x^2 \neq -1$

$\Rightarrow \text{ÇK(SS)} = \{0, 1\}$

Yanıt / The Answer is C

12. $f(x): A \rightarrow \{0, 1\} \Rightarrow \text{sgn}(x-2) = 0 \quad \wedge \quad \text{sgn}(x-2) = 1$

$x - 2 = 0 \qquad x - 2 > 0$

$x = 2 \qquad x > 2$

$\Rightarrow A = [2, \infty)$

Yanıt / The Answer is D

1. $f(x)=\dfrac{x^2+2x-4}{|x-4|-3}$ **fonksiyonunun en geniş tanım kümesi nedir?**

What is the largest domain of the function $f(x)=\dfrac{x^2+2x-4}{|x-4|-3}$?

Yanıt / The Answer is **R – {1, 7}**

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2. $f(x)=\sqrt{4-\log_2(x-1)}$ **fonksiyonunun en geniş tanım kümesi nedir?**

What is the largest domain of the function $f(x)=\sqrt{4-\log_2(x-1)}$?

Yanıt / The Answer is **(1, 17]**

---

3. f(x) çift fonksiyondur. / *f(x) is an even function.*

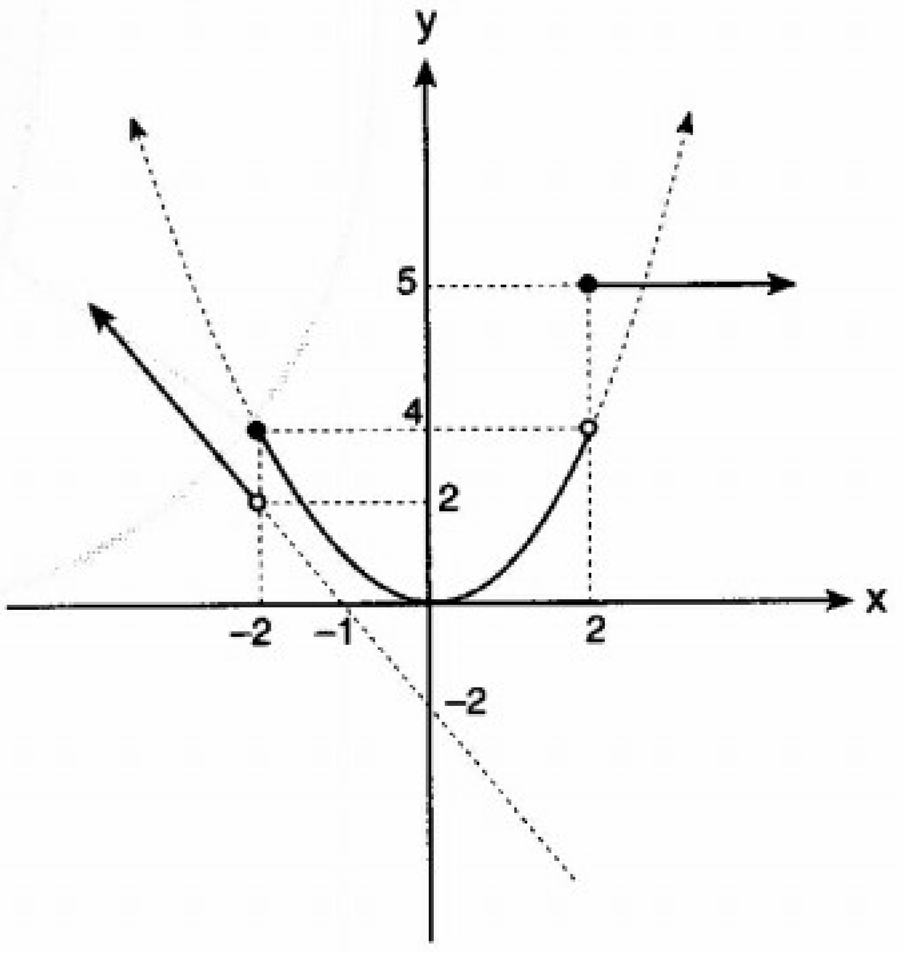
$f(x)-2f(-x)=3x^2-6 \Rightarrow$ **$f(x^2)=?$**

Yanıt / The Answer is **x^4-2**

4. $f(x)=\begin{cases}2x-3\,, & x>1\\ x^2-4\,, & x\le 1\end{cases}$, $g(x)=\begin{cases}x+3 & , x<4\\ 4 & , x\ge 4\end{cases} \Rightarrow (f+g)(x)=?$

Yanıt / The Answer is $(\mathbf{f+g})(\mathbf{x})=\begin{cases}\mathbf{x^2+x-1} & \mathbf{x\le 1}\\ \mathbf{3x} & \mathbf{1<x<4}\\ \mathbf{2x+1} & \mathbf{x\ge 4}\end{cases}$

5.



$\Rightarrow$ **f(x) = ?**

Yanıt / The Answer is $\mathbf{f(x)}=\begin{cases}\mathbf{-2x-2} & \mathbf{x<-2}\\ \mathbf{x^2} & \mathbf{-2\le x<2}\\ \mathbf{5} & \mathbf{2\le x}\end{cases}$

6. $f(x) = |2-x| + \left[\left|-\frac{x}{5}\right|\right] + \operatorname{sgn}\left(\frac{4-x^2}{x}\right) \Rightarrow$ **$f(-6) = ?$**

Yanıt / The Answer is **10**

7. $2\,[|\,x+3|] + [|x-7|] - [|x-9|] = 20 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is **[6, 7)**

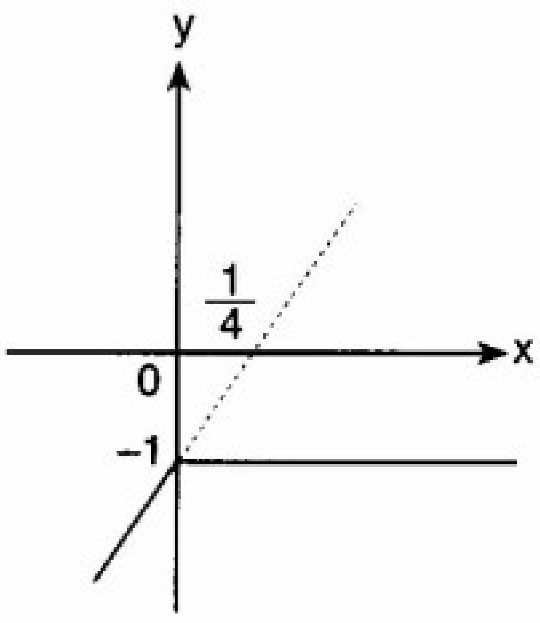
8. $f: R \to R,\ \ g: R \to R,$

$f: x \to x - |x|,$

$g: x \to 2x - 1$

$\Rightarrow$ **$(gof)\,(x) = ?$**

Yanıt / The Answer is



9. $f(x) = |x-6| + |3-x| + 2 + x \Rightarrow$ **$f(5) = ?$**

Yanıt / The Answer is **10**

10. $x \in Z,$

$4 \le [|3x-5|] < 13 \Rightarrow$ **$\sum x = ?$**

Yanıt / The Answer is **12**

11. $x \in Z,$

$|x^2 - 7x + 15| = 3 \Rightarrow$ **$\sum x = ?$**

Yanıt / The Answer is **7**

1. $f(x)=\dfrac{5}{\left[\left|1-\log x\right|\right]}$ **fonksiyonunun en geniş tanım kümesi nedir?**

Which of the following is the largest domain of the function $f(x)=\dfrac{5}{\left[\left|1-\log x\right|\right]}$ *?*

A) ∅ B) R C) R – (0,10]

D) R – [0,10) E) (0,10]

2. $\left[\left|3x+1\right|\right]<10$ ⇒ **ÇK(SS) = ?**

A) $(-\infty,3)$ B) $(-\infty,0)$ C) $(0, 3)$

D) $(3, 9)$ E) $(3, \infty)$

3. $\text{sgn}(x^2-2x-15)=-1$ ⇒ **ÇK(SS) = ?**

A) $(-\infty,-3)$

B) $(-\infty,5)$

C) $(-\infty,-3)\cup(5,\infty)$

D) $(-3, 5)$

E) $(-5, 3)$

4. $f(x)=9-\left[\left|\dfrac{x}{3}\right|\right]$ ⇒ **f(10) = ?**

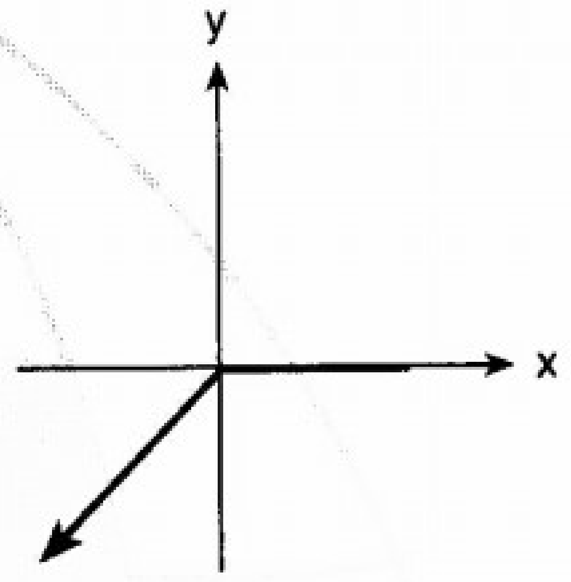
A) 9 B) 8 C) 7

D) 6 E) 5

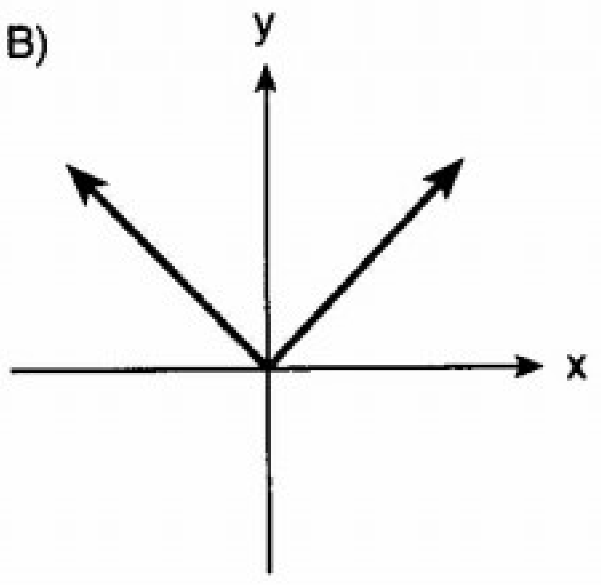
5. **$2\cdot f(x)=x+|x|$ fonksiyonunun grafiği aşağıdakilerden hangisidir?**

Which of the following is the graph of the function $2\cdot f(x)=x+|x|=$ *?*

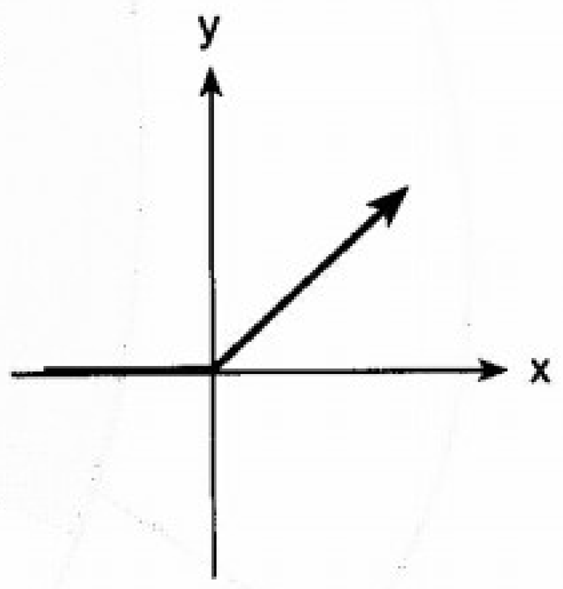
A)



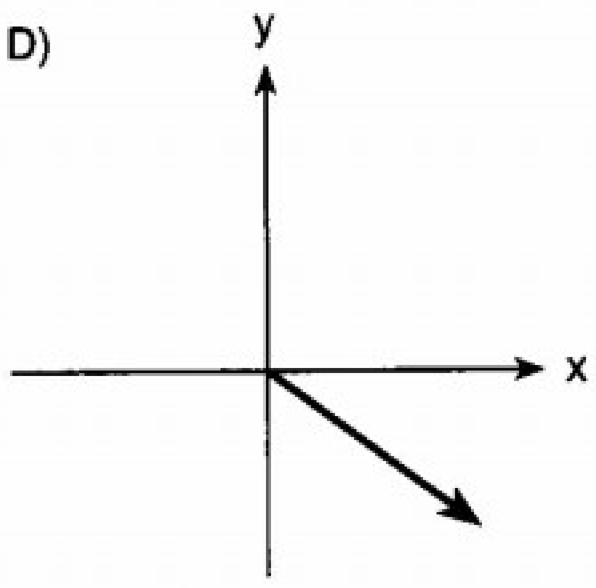
B)



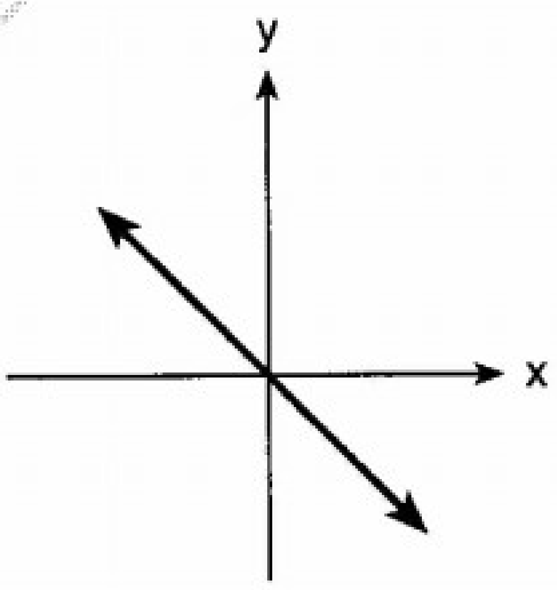
C)



D)



E)



6. e doğal logaritma tabandır.

e is the canoncial basis of a logarithm.

$f(x)=\left[\left|\,|x|\,\right|\right]-\left|\left[\left|x\right|\right]\right|$ ⇒ **f(–e) = ?**

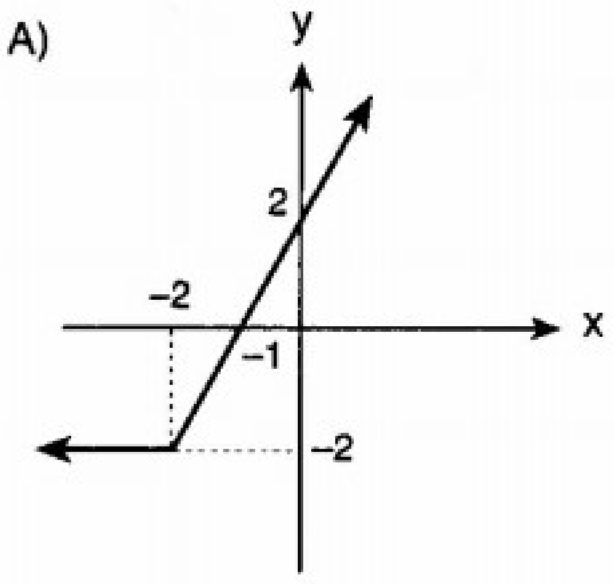
A) –2 B) –1 C) 0

D) 1 E) 2

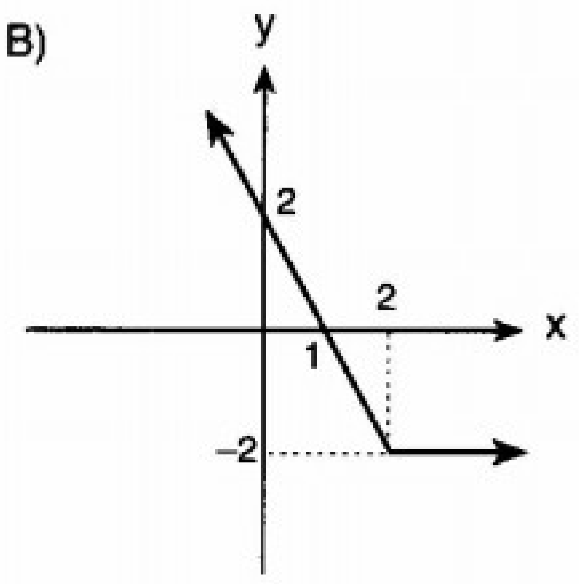
7. **f(x) = |2 − x| − x fonksiyonunun grafiği aşağıdakilerden hangisidir?**

Which of the followings is the graph of the function $f(x) = |2 - x| - x$?

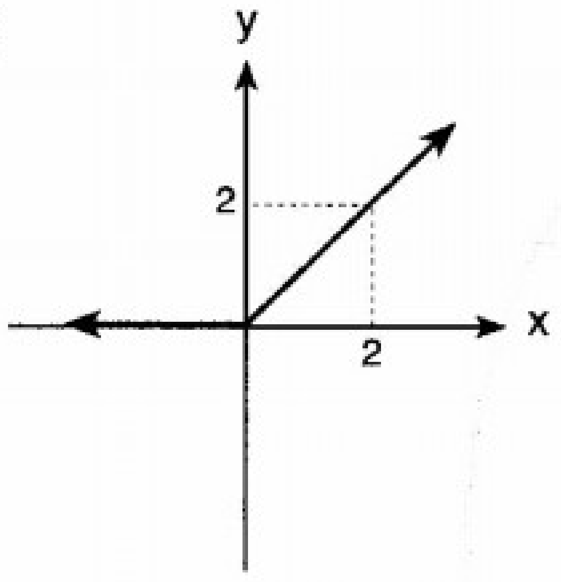
A)



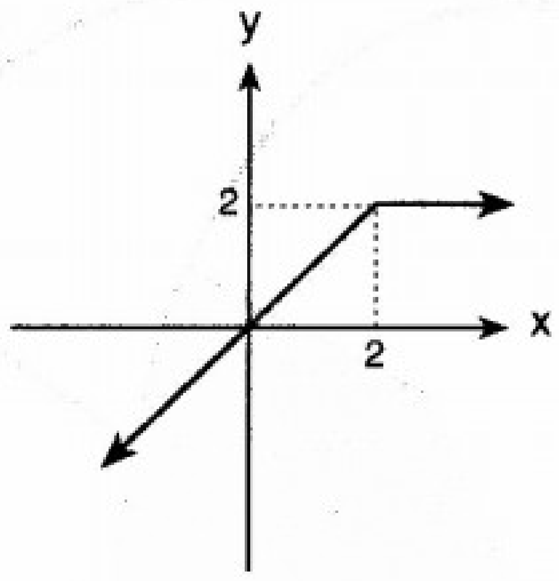
B)



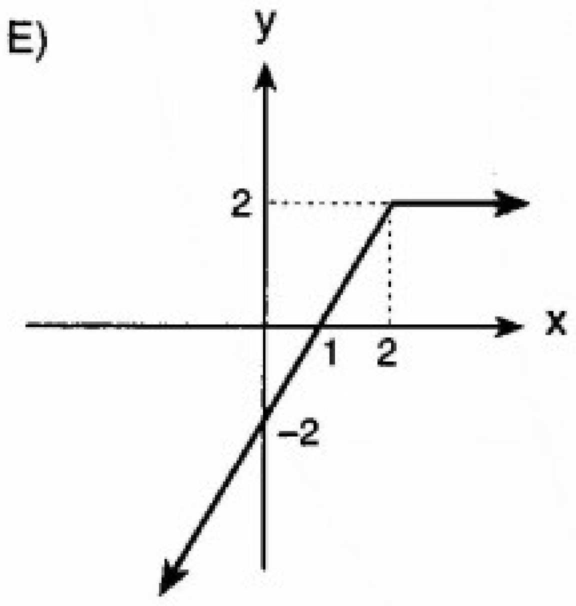
C)



D)



E)



8. $f(x) = \dfrac{3\sqrt{x-5}}{1-\text{sgn}(x^2-9x+14)}$ **fonksiyonunun en geniş tanım kümesi nedir?**

Which of the following is the largest domain of the function $f(x) = \dfrac{3\sqrt{x-5}}{1-\text{sgn}(x^2-9x+14)}$?

A) [1, 5] B) (1, 6) C) [5, 7]

D) [3, 8] E) (3, 8)

9. $f(x) = \left[\!\left| \dfrac{x}{3} \right|\!\right] - x \cdot \text{sgn}(1-x) \Rightarrow$ **f(7) + f(−2) = ?**

A) 10 B) 9 C) 8

D) −4 E) −2

10. $f(x) = \begin{cases} x^2+1 & x<0 \\ x-\text{sgn}(x) & x \geq 0 \end{cases}$

$g(x) = x - |x-2| \Rightarrow$ **$fog(0) + gof(3) = ?$**

A) 0 B) 3 C) 5

D) 6 E) 7

11. $\displaystyle\sum_{k=1}^{1962} \text{sgn}(k^2+7k-30) = ?$

A) 1955 B) 1957 C) 1959

D) 1962 E) 1972

12. $\left[\!\left| \dfrac{x}{2} - 1 \right|\!\right] = 3$ **denklemini sağlayan x ∈ Z kaç tanedir?**

How many x ∈ Z can be found that satisfies the equation $\left[\!\left| \dfrac{x}{2} - 1 \right|\!\right] = 3$?

A) 1 B) 2 C) 3

D) 4 E) 5

YANITLAR / ANSWERS

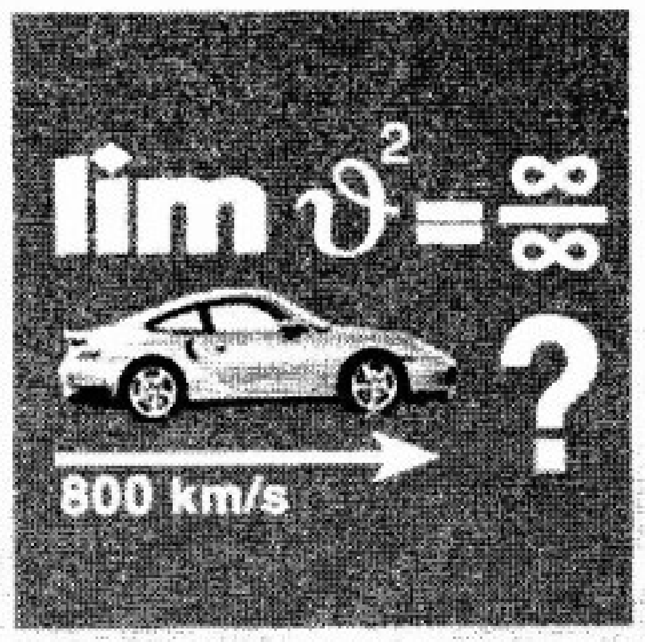
1. C	2. A	3. D	4. D	5. C	6. B	7. B	8. C
9. A	10. E	11. B	12. B				

ÜNİTE 9

UNIT

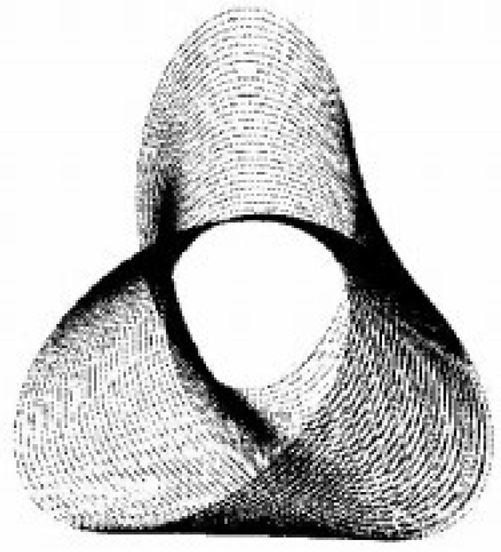
Bu ünitede, limit ve türev konuları ayrıntılı olarak anlatılmıştır. Ilk olarak, limit ve belirsizlikler anlatılmış, daha sonra fonksiyonların türevi açıklanmıştır. Son olarak, limitin türeve uygulanışı açıklanmıştır.

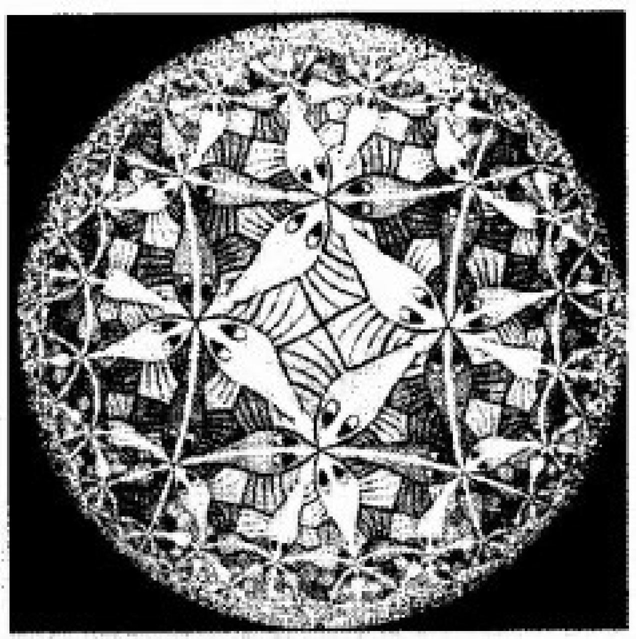
Bu ünite; 132 çözümlü örnek, 48 alıştırma ve 144 test sorusundan oluşmaktadır.

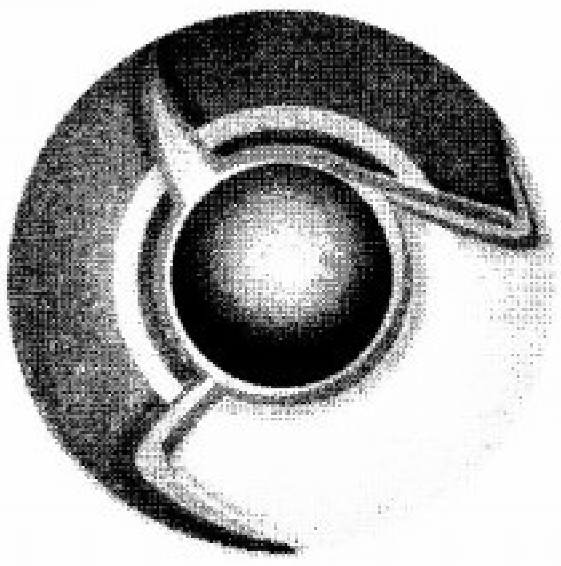


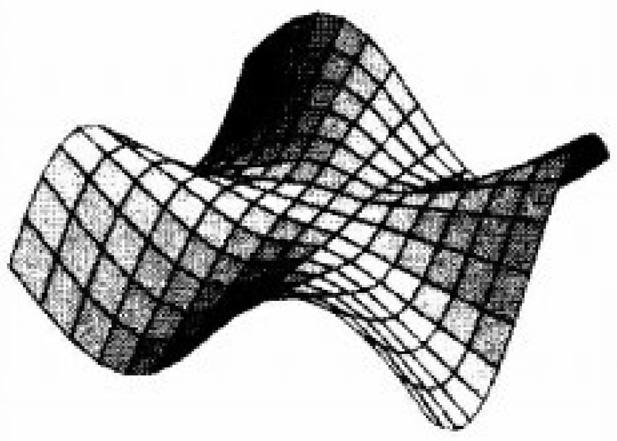
In this unit, limits and derivative are explained in detailed. Firstly, limit and indeterminate forms are explained. Later, derivative of functions is explained. Subsequently, apply the derivative of limits is explained.

This unit includes; 144 test questions.



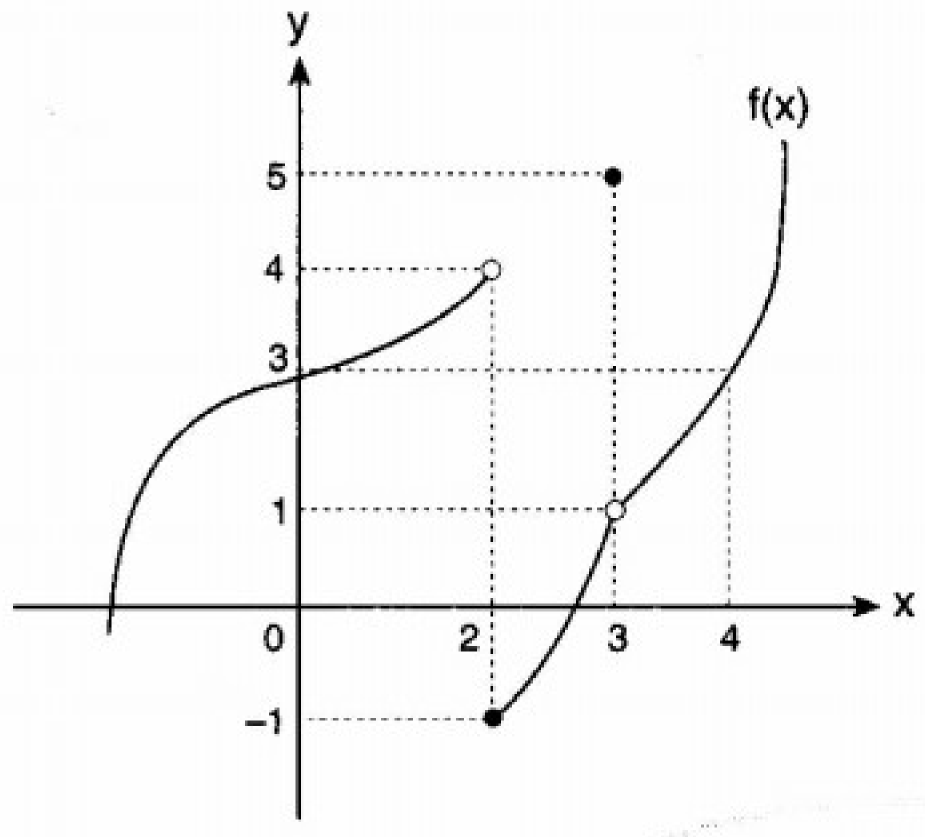






- **LİMİT / *LIMITS*** .... 643 – 682
- **TÜREV / *DERIVATIVE*** .... 683 – 738

1.



$$\lim_{x\to 2^-} f(x) + \lim_{x\to 3} f(x) + \lim_{x\to 4^+} f(x) = ?$$

A) 12 B) 10 C) 9

D) 8 E) 6

---

2. $f(x)=\begin{cases} 3x+a & x<2 \\ x+b & x=2 \\ 5x+c & x>2 \end{cases}$

$\lim_{x\to 2} f(x) = -3 \Rightarrow$ **a + c = ?**

A) –20

B) –22

C) –24

D) –25

E) –27

---

3. $\lim_{x\to\infty} \left(\frac{2}{3}\right)^x + 5^{\frac{3}{x}} = ?$

A) 1

B) $\frac{2}{3}$

C) $\frac{3}{2}$

D) $\frac{4}{9}$

E) $\frac{17}{3}$

---

4. $\lim_{x\to 4^+} \frac{|x^2-3x-4|}{x-4} = ?$

A) –5

B) –3

C) 1

D) 3

E) 5

---

5. $\lim_{x\to -1} \frac{x^3+5x^2-2x}{3x^4-2x^3-4x^2+1} = ?$

A) 1

B) 2

C) 3

D) 4

E) 5

---

6. $\lim_{x\to \frac{\pi}{6}} \frac{\cot x - 2\cos x}{\sin x + \tan x} = ?$

A) – 2

B) – 1

C) 0

D) 1

E) 2

7. $\lim\limits_{x\to 0} \dfrac{\cos x - \cos^3 x}{x^2} = ?$

A) -2

B) -1

C) 0

D) 1

E) 2

8. $\lim\limits_{x\to 0} \dfrac{\sin 3x}{x} = ?$

A) -3

B) -1

C) 0

D) 1

E) 3

9. $\lim\limits_{x\to 1} \dfrac{\sin(x-1)}{x^2-1} = ?$

A) $\frac{1}{2}$

B) 1

C) $\frac{3}{2}$

D) 2

E) $\frac{5}{2}$

10. $\lim\limits_{x\to 0} \dfrac{\sin^2 x + \tan^2 x}{4x^2} = ?$

A) $\frac{1}{2}$

B) $\frac{1}{3}$

C) $\frac{1}{4}$

D) $\frac{1}{5}$

E) $\frac{1}{6}$

11. $\lim\limits_{x\to 1} \dfrac{ax - \sqrt{x+3}}{x^2-1} = b,\ b \in R \Rightarrow$ **a = ?**

A) 2

B) 3

C) 4

D) 5

E) 6

12. $\lim\limits_{x\to \infty} \dfrac{x^3 - 3}{3x^3 + 2x + 1} = ?$

A) $-\frac{1}{3}$

B) $-\frac{1}{2}$

C) $\frac{1}{3}$

D) $\frac{1}{2}$

E) 1

YANITLAR / ANSWERS							
1. D	2. B	3. A	4. E	5. C	6. C	7. D	8. E
9. A	10. A	11. A	12. C				

1.

$$\left.\begin{array}{l}\lim\limits_{x\to 2^-} f(x)=4\\ \lim\limits_{x\to 3} f(x)=1\\ \lim\limits_{x\to 4^+} f(x)=3\end{array}\right\} \Rightarrow \lim_{x\to 2^-} f(x)+\lim_{x\to 3} f(x)+\lim_{x\to 4^+} f(x)=8$$

Yanıt / The Answer is D

2.

$$\lim_{x\to 2} f(x)=-3 \Rightarrow \lim_{x\to 2^-} f(x)=\lim_{x\to 2^+} f(x)=-3$$

$$\lim_{x\to 2^-} f(x)=\lim_{x\to 2^-}(3x+a)=6+a=-3 \Rightarrow a=-9$$

$$\lim_{x\to 2^+} f(x)=\lim_{x\to 2^+}(5x+c)=10+c=-3 \Rightarrow c=-13$$

$$\Rightarrow a+c=-9-13=-22$$

Yanıt / The Answer is B

3.

$$\lim_{x\to\infty}\left(\frac{2}{3}\right)^x+5^{\frac{3}{x}}=\left(\frac{2}{3}\right)^{\infty}+5^{\frac{3}{\infty}}$$

$$0<\frac{2}{3}<1 \Rightarrow \left(\frac{2}{3}\right)^{\infty}=0$$

$$\frac{3}{\infty}=0 \Rightarrow 5^0=1$$

$$\left(\frac{2}{3}\right)^{\infty}+5^{\frac{3}{\infty}}=0+1=1$$

Yanıt / The Answer is A

4.

$$\lim_{x\to 4^+}\frac{|x^2-3x-4|}{x-4}=\lim_{x\to 4^+}\frac{|x-4|\cdot|x+1|}{x-4}$$

$$=\lim_{x\to 4^+}\frac{(x-4)\cdot(x+1)}{x-4}$$

$$\Rightarrow \lim_{x\to 4^+}(x+1)=5$$

Yanıt / The Answer is E

5.

$$\lim_{x\to -1}\frac{x^3+5x^2-2x}{3x^4-2x^3-4x^2+1}$$

$$=\frac{(-1)^3+5\cdot(-1)^2-2\cdot(-1)}{3\cdot(-1)^4-2\cdot(-1)^3-4\cdot(-1)^2+1}$$

$$=\frac{-1+5+2}{3+2-4+1}$$

$$=\frac{6}{2}$$

$$=3$$

Yanıt / The Answer is C

6.

$$\lim_{x\to\frac{\pi}{6}}\frac{\cot x-2\cos x}{\sin x+\tan x}=\frac{\cot\frac{\pi}{6}-2\cos\frac{\pi}{6}}{\sin\frac{\pi}{6}+\tan\frac{\pi}{6}}$$

$$=\frac{\sqrt{3}-2\cdot\frac{\sqrt{3}}{2}}{\frac{1}{2}+\frac{\sqrt{3}}{3}}$$

$$=\frac{\sqrt{3}-\sqrt{3}}{\frac{3+2\sqrt{3}}{6}}=0$$

Yanıt / The Answer is C

7. $\lim\limits_{x\to 0} \dfrac{\cos x - \cos^3 x}{x^2} = \lim\limits_{x\to 0} \dfrac{\cos x \cdot (1-\cos^2 x)}{x^2}$

$= \lim\limits_{x\to 0} \cos x \cdot \lim\limits_{x\to 0} \dfrac{\sin^2 x}{x^2}$

$= 1 \cdot 1 = 1$

Yanıt / The Answer is D

8. $\lim\limits_{x\to 0} \dfrac{\sin 3x}{x} = 3 \cdot \lim\limits_{3x\to 0} \dfrac{\sin 3x}{3x} = 3$

Yanıt / The Answer is E

9. $\lim\limits_{x\to 1} \dfrac{\sin(x-1)}{x^2-1} = \dfrac{\sin 0}{0} = \dfrac{0}{0}$

$\lim\limits_{x\to 1} \dfrac{\sin(x-1)}{x^2-1} = \lim\limits_{x\to 1} \dfrac{\sin(x-1)}{(x-1)(x+1)}$

$= \lim\limits_{x\to 1} \dfrac{\sin(x-1)}{x-1} \cdot \lim\limits_{x\to 1} \dfrac{1}{x+1} \quad \left[\begin{array}{l} x-1=t \\ x\to 1 \Rightarrow t\to 0 \end{array}\right]$

$= \lim\limits_{t\to 0} \dfrac{\sin t}{t} \cdot \lim\limits_{t\to 0} \dfrac{1}{t+2}$

$= 1 \cdot \dfrac{1}{2} = \dfrac{1}{2}$

Yanıt / The Answer is A

10. $\lim\limits_{x\to 0} \dfrac{\sin^2 x + \tan^2 x}{4x^2} = \lim\limits_{x\to 0} \left(\dfrac{\sin^2 x}{4x^2} + \dfrac{\tan^2 x}{4x^2} \right)$

$= \dfrac{1}{4} + \dfrac{1}{4}$

$= \dfrac{2}{4} = \dfrac{1}{2}$

Yanıt / The Answer is A

11. $\lim\limits_{x\to 1} \dfrac{ax - \sqrt{x+3}}{x^2-1} = \dfrac{a-\sqrt{4}}{1^2-1} = b$

$b \in R \;\Rightarrow\; a - \sqrt{4} = 0$

$a = 2$

Yanıt / The Answer is A

12. $\lim\limits_{x\to\infty} \dfrac{x^3-3}{3x^3+2x+1} \quad \lim\limits_{x\to\infty} = \dfrac{x^3 \cdot \left(1 - \dfrac{2}{x^2} + \dfrac{5}{x^3}\right)}{x^3 \cdot \left(3 + \dfrac{1}{x^2} - \dfrac{2}{x^3}\right)}$

$= \dfrac{1 - \dfrac{2}{\infty^2} + \dfrac{5}{\infty^3}}{3 + \dfrac{1}{\infty^2} + \dfrac{2}{\infty^3}}$

$= \dfrac{1-0+0}{3+0-0}$

$= \dfrac{1}{3}$

Yanıt / The Answer is C

1. $\lim\limits_{x \to \infty} \dfrac{(a-2)x^3 - 3x^2 + x + 1}{bx^2 + 4x + 5} = 3 \Rightarrow a + b = ?$

A) -3
B) -2
C) -1
D) 1
E) 2

2. $\lim\limits_{x \to \infty} \dfrac{3x^2 - 3x + 4}{x^3 - 4x + 5} = ?$

A) -1
B) 0
C) 1
D) 2
E) 3

3. $\lim\limits_{x \to \infty} \dfrac{2^{x+1} + 3^{x+1}}{2^x + 3^x} = ?$

A) $\dfrac{1}{3}$
B) $\dfrac{2}{3}$
C) 1
D) $\dfrac{3}{2}$
E) 3

4. $\lim\limits_{x \to \infty} \left(\dfrac{\sin x}{x} + \dfrac{x^2 + 3x}{2x^2 - 1} \right) = ?$

A) $\dfrac{3}{2}$
B) $\dfrac{1}{2}$
C) 1
D) 2
E) ∞

5. $\lim\limits_{x \to -\infty} \dfrac{4}{1 - 3^{\frac{x}{1-x}}} = ?$

A) 4
B) 6
C) 8
D) 10
E) 12

6. $\lim\limits_{x \to -4} \left(\dfrac{1}{x+4} - \dfrac{8}{16 - x^2} \right) = ?$

A) $\dfrac{1}{2}$
B) $\dfrac{1}{4}$
C) $\dfrac{1}{8}$
D) $-\dfrac{1}{4}$
E) $-\dfrac{1}{8}$

7. $\lim\limits_{x\to-\infty}\left(\sqrt{x^2-4x+6}-\sqrt{x^2+ax+3}\right)=6 \Rightarrow a=?$

A) –16
B) –12
C) –8
D) 8
E) 16

8. $\lim\limits_{x\to 0} 2x\cdot\cot 4x=?$

A) $\frac{1}{2}$
B) 1
C) $\frac{3}{2}$
D) 2
E) 4

9. $\lim\limits_{x\to\infty}\left(\frac{x+5}{x+1}\right)^{3x+2}=?$

A) e
B) e^3
C) e^4
D) e^6
E) e^{12}

10. $\lim\limits_{x\to\infty}\left(\frac{3x+1}{3x-2}\right)^{x}=?$

A) e
B) e^2
C) e^3
D) e^4
E) e^5

11. $\lim\limits_{x\to 1} x^{\frac{1}{1-x}}=?$

A) e^{-1}
B) 1
C) e
D) e^2
E) e^3

12. $\lim\limits_{x\to\infty}\left(e^{\frac{1}{x}}+\frac{2}{x}\right)^{2x}=?$

A) 0
B) 1
C) e
D) e^2
E) e^4

YANITLAR / ANSWERS							
1. D	2. B	3. E	4. A	5. B	6. E	7. D	8. A
9. E	10. A	11. A	12. E				

1. $\lim\limits_{x\to\infty} \dfrac{(a-2)x^3-3x^2+x+1}{bx^2+4x+5}=3$

$\lim\limits_{x\to\infty} f(x)=3 \;\Rightarrow\; a-2=0\,,\; b=-1$

$\Rightarrow a+b=2-1=1$

Yanıt / The Answer is D

---

2. $\lim\limits_{x\to\infty} \dfrac{3x^2-3x+4}{x^3-4x+5}=\lim\limits_{x\to\infty}\dfrac{3x^2}{x^3}=\lim\limits_{x\to\infty}\dfrac{3}{x}=\dfrac{3}{\infty}=0$

Yanıt / The Answer is B

---

3. $\lim\limits_{x\to\infty} \dfrac{2^{x+1}+3^{x+1}}{2^x+3^x}=\lim\limits_{x\to\infty}\dfrac{3^{x+1}\left(\left(\dfrac{2}{3}\right)^{x+1}+1\right)}{3^x\left(\left(\dfrac{2}{3}\right)^{x}+1\right)}=3$

Yanıt / The Answer is E

---

4. $\lim\limits_{x\to\infty}\left(\dfrac{\sin x}{x}+\dfrac{x^2+3x}{2x^2-1}\right)=\lim\limits_{x\to\infty}\dfrac{\sin x}{x}+\lim\limits_{x\to\infty}\dfrac{x^2+3x}{2x^2-1}$

$=0+\dfrac{1}{2}=\dfrac{1}{2}$

Yanıt / The Answer is B

---

5. $\lim\limits_{x\to-\infty}\dfrac{4}{1-3^{\frac{x}{1-x}}}=\dfrac{4}{1-3^{\lim\limits_{x\to-\infty}\frac{x}{1-x}}}$

$=\dfrac{4}{1-3^{-1}}$

$=\dfrac{4}{1-\dfrac{1}{3}}$

$=\dfrac{12}{2}=6$

Yanıt / The Answer is B

---

6. $\lim\limits_{x\to-4}\left(\dfrac{1}{x+4}-\dfrac{8}{16-x^2}\right)=\lim\limits_{x\to-4}\dfrac{x-4+8}{x^2-16}$

$=\lim\limits_{x\to-4}\dfrac{1}{x-4}$

$=-\dfrac{1}{8}$

Yanıt / The Answer is E

7. $\lim\limits_{x\to-\infty}\left(\sqrt{x^2-4x+6}-\sqrt{x^2+ax+3}\right)$

$$=\lim_{x\to-\infty}\sqrt{x^2-4x+6}-\lim_{x\to-\infty}\sqrt{x^2+ax+3}=6$$

$$=\sqrt{1}\lim_{x\to-\infty}\left|x-\frac{4}{2}\right|-\sqrt{1}\lim_{x\to-\infty}\left|x+\frac{a}{2}\right|=6$$

$$=-x+2+x+\frac{a}{2}=6$$

$$2+\frac{a}{2}=6 \Rightarrow a=8$$

Yanıt / The Answer is D

8. $\lim\limits_{x\to0} 2x\cdot\cot 4x \quad (0\cdot\infty)$

$$\lim_{x\to0}\frac{2x}{\dfrac{1}{\cot 4x}}=\lim_{x\to0}\frac{2x}{\tan 4x} \qquad \left(\frac{0}{0}\right)$$

$$\Rightarrow \lim_{x\to0}\frac{2x}{\tan 4x}=\frac{1}{2}$$

Yanıt / The Answer is A

9. $\lim\limits_{x\to\infty}\left(\dfrac{x+5}{x+1}\right)^{3x+2}=\lim\limits_{x\to\infty}\left(1+\dfrac{4}{x+1}\right)^{3x+2}$

$$\left.\begin{aligned}&\lim_{x\to\infty}\frac{4}{x+1}=0\\&\lim_{x\to\infty}3x+2=\infty\\&\lim_{x\to\infty}\frac{4}{x+1}\cdot(3x+2)=12\end{aligned}\right\}\Rightarrow \lim_{x\to\infty}\left(1+\frac{4}{x+1}\right)^{3x+2}=e^{12}$$

Yanıt / The Answer is E

10. $\lim\limits_{x\to\infty}\left(\dfrac{3x+1}{3x-2}\right)^{x}=\lim\limits_{x\to\infty}\left(1+\dfrac{3}{3x-2}\right)^{x}$

$$\left.\begin{aligned}&\lim_{x\to\infty}\frac{3}{3x-2}=0\\&\lim_{x\to\infty}x=\infty\\&\lim_{x\to\infty}\frac{3}{3x-2}\cdot x=1\end{aligned}\right\}\Rightarrow \lim_{x\to\infty}\left(1+\frac{3}{3x-2}\right)^{x}=e$$

Yanıt / The Answer is A

11. $\dfrac{1}{1-x}=t \Rightarrow x=\dfrac{t-1}{t}$

$$\lim_{x\to1}x^{\frac{1}{1-x}}=\lim_{t\to\infty}\left(1-\frac{1}{t}\right)^{t}=e^{-1}$$

Yanıt / The Answer is A

12. $\lim\limits_{x\to\infty}\left(e^{\frac{1}{x}}+\dfrac{2}{x}\right)^{2x}=\lim\limits_{x\to\infty}\left(1+\dfrac{2}{x}\right)^{2x}$

$$\left.\begin{aligned}&\lim_{x\to\infty}\frac{2}{x}=0\\&\lim_{x\to\infty}2x=\infty\\&\lim_{x\to\infty}2x\cdot\frac{2}{x}=4\end{aligned}\right\}\Rightarrow \lim_{x\to\infty}\left(1+\frac{2}{x}\right)^{2x}=e^{4}$$

Yanıt / The Answer is E

1. $\lim\limits_{x\to 3^-} \dfrac{\sqrt{x^2-6x+9}}{x-3} = ?$

Yanıt / The Answer is: **−1**

---

2. $f(x) = \begin{cases} x+2 & x \geq 2 \\ 2x-1 & x < 2 \end{cases}$

$\Rightarrow \lim\limits_{x\to 2^-} f(x) + \lim\limits_{x\to 2^+} f(x) + \lim\limits_{x\to 3} f(x) = ?$

Yanıt / The Answer is: **12**

---

3. $\lim\limits_{\frac{a}{b}\to 1} \dfrac{4a+3b}{2a+b} = ?$

Yanıt / The Answer is: $\dfrac{7}{3}$

---

4. $\lim\limits_{x\to 2^-} \left(\dfrac{|x-2|}{x-2}\right) + \lim\limits_{x\to 2^+} \left(\dfrac{|x-2|}{x-2}\right) = ?$

Yanıt / The Answer is: **0**

---

5. $\lim\limits_{x\to -\infty} \dfrac{3 \cdot 2^x + 7}{4 - 2^{x+1}} = ?$

Yanıt / The Answer is: $\dfrac{7}{4}$

---

6. $\lim\limits_{x\to 2} \dfrac{4x^2-2x+m-2}{x^2-4} \in \mathbb{R} \Rightarrow m = ?$

Yanıt / The Answer is: **−10**

7. $\lim\limits_{x \to 2} \dfrac{\tan(2x-4)}{x-2} = ?$

Yanıt / The Answer is: **2**

8. $\lim\limits_{\theta \to x} \dfrac{\tan x - \tan\theta}{\tan(\theta - x)} = ?$

Yanıt / The Answer is: $-\sec^2 x$

9. $\lim\limits_{x \to 3} \dfrac{x^3 - 3x^2 + x - 3}{x^2 - x - 6} = ?$

Yanıt / The Answer is: **2**

10. $\lim\limits_{x \to \frac{\pi}{4}} \dfrac{\sin x - \cos x}{1 - \tan x} = ?$

Yanıt / The Answer is: $-\dfrac{\sqrt{2}}{2}$

11. $\lim\limits_{x \to 0} \left(\dfrac{\sin 3x}{x} + \dfrac{2x}{\tan x} \right) = ?$

Yanıt / The Answer is: **5**

12. $\lim\limits_{x \to 0} \left(\dfrac{\sin^3 x}{8x^3} \right) = ?$

Yanıt / The Answer is: $\dfrac{1}{8}$

13. $\lim\limits_{x\to\frac{\pi}{4}} \dfrac{\sin^2 x-\cos^2 x}{\sin x-\cos x}=?$

Yanıt / The Answer is: **$\sqrt{2}$**

14. $\lim\limits_{x\to\frac{\pi}{2}} \dfrac{\sin\left(x-\frac{\pi}{2}\right)}{\cos x}=k, \quad k\in R$

$\Rightarrow \lim\limits_{x\to k} (3^{x+1}+e^{-x})=?$

Yanıt / The Answer is: **1 + e**

15. $\lim\limits_{x\to\frac{\pi}{2}} \dfrac{\sin(\cos x)}{\cos^2\frac{x}{2}-\sin^2\frac{x}{2}}=?$

Yanıt / The Answer is: **1**

16. $\lim\limits_{x\to 9} \dfrac{2\sqrt{x}-6}{x-9}=?$

Yanıt / The Answer is: $\dfrac{1}{3}$

17. $\lim\limits_{y\to x} \dfrac{\sin^2 y-\sin^2 x}{y^2-x^2}=?$

Yanıt / The Answer is: **1**

18. $\lim\limits_{x\to\infty} \left(\sqrt{x^2+7x}-\sqrt{x^2+2x}\right)=?$

Yanıt / The Answer is: $\dfrac{5}{2}$

19. $\lim\limits_{x \to -\infty} \left(\sqrt{4x^2 + 6x} - \sqrt{4x^2 + 9} \right) = ?$

Yanıt / The Answer is: $-\dfrac{3}{2}$

20. $\lim\limits_{x \to 5} \left(\dfrac{1}{x-5} - \dfrac{3x-8}{x^2 - 3x - 10} \right) = ?$

Yanıt / The Answer is: $\dfrac{-2}{7}$

21. $\lim\limits_{x \to \infty} \left(x \cdot \tan \dfrac{3}{x} \right) = ?$

Yanıt / The Answer is: **3**

22. $\lim\limits_{x \to \infty} \left[(x^2 - 4) \cdot \dfrac{3}{2x} \right] = ?$

Yanıt / The Answer is: ∞

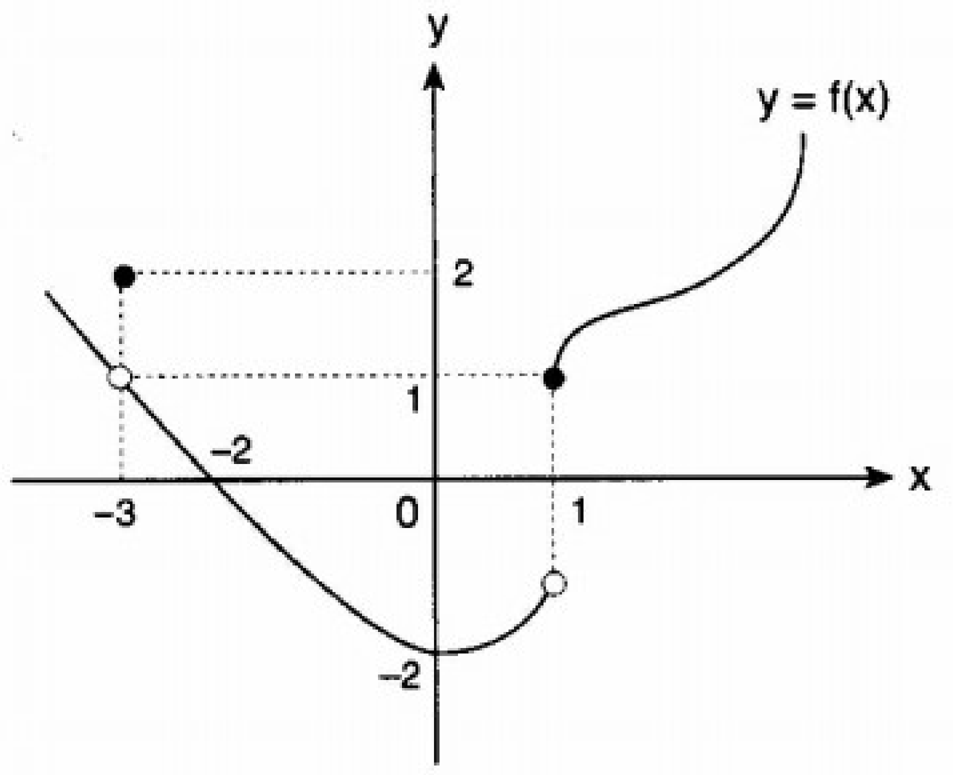
23. $\lim\limits_{x \to \infty} \left(\dfrac{x-2}{x+2} \right)^{x+2} = ?$

Yanıt / The Answer is: e^{-4}

24. $\lim\limits_{x \to 0} (1+3x)^{\frac{2}{x}} = ?$

Yanıt / The Answer is: e^{6}

1.



$\lim\limits_{x\to -3} f(x) + \lim\limits_{x\to -2} f(x) + \lim\limits_{x\to 1^+} f(x) = ?$

A) 1 B) 2 C) 3 D) 4 E) 5

2. $\lim\limits_{x\to 3} 2x^2 - 7x + 6 = ?$

A) 0
B) 2
C) 3
D) 5
E) 8

3. $f(x) = \begin{cases} x^2 + x - 1 & x \le 1 \\ x^2 - x & x > 1 \end{cases}$

$\Rightarrow \lim\limits_{x\to 1^-} f(x) = ?$

A) 0
B) 1
C) 2
D) 3
E) 4

4. $\lim\limits_{x\to 3} \dfrac{x^2 - 2x + 5}{x - 1} = ?$

A) 0
B) 2
C) 4
D) 6
E) 8

5. $\lim\limits_{x\to 1} \dfrac{|x-3|}{x^2 + 1} = ?$

A) –1
B) 0
C) 1
D) 3
E) 5

6. $\lim\limits_{x\to \frac{\pi}{2}} \dfrac{\sin 2x + 1}{\cos x - 3} = ?$

A) $-\dfrac{1}{3}$
B) $-\dfrac{1}{4}$
C) $-\dfrac{1}{5}$
D) $-\dfrac{1}{6}$
E) $-\dfrac{1}{7}$

7. $\lim\limits_{x \to y} \dfrac{3x^2 - y^2}{x^2 + y^2} = ?$

A) –1

B) 0

C) 1

D) 2

E) 3

8. $\lim\limits_{x \to 3^+} \dfrac{|x-3|}{2x + |x-2|} = ?$

A) $\dfrac{1}{4}$

B) $\dfrac{1}{5}$

C) $\dfrac{1}{6}$

D) 0

E) $\dfrac{1}{8}$

9. $f(x) = \begin{cases} 2x^2 - 3 & x \le 1 \\ x^2 + 2 & x > 1 \end{cases}$

$\Rightarrow \lim\limits_{x \to 1^+} f(x) = ?$

A) –3

B) –1

C) 1

D) 3

E) 5

10. $\lim\limits_{x \to -\infty} \left(5^x + \dfrac{4}{x} + 3\right) = ?$

A) 1

B) 3

C) 4

D) 5

E) 6

11. $\lim\limits_{x \to 3^+} \dfrac{|x^2 - 2x - 3|}{x-3} = ?$

A) –4

B) –2

C) 1

D) 4

E) 5

12. $\lim\limits_{x \to 2^-} \dfrac{|x^2 - 4|}{x-2} = ?$

A) –6

B) –4

C) 0

D) 2

E) 4

YANITLAR / ANSWERS							
1. B	2. C	3. B	4. C	5. C	6. A	7. C	8. D
9. D	10. B	11. D	12. B				

1. $\lim\limits_{x \to 3} \dfrac{x^2+2x-15}{x^2-9} = ?$

A) $\frac{3}{2}$

B) $\frac{4}{3}$

C) $\frac{5}{4}$

D) $\frac{6}{5}$

E) $\frac{7}{6}$

2. $\lim\limits_{x \to -2} \dfrac{x^3+2x^2+x+2}{x^2-4} = ?$

A) $-\frac{1}{4}$

B) $-\frac{3}{4}$

C) $-\frac{5}{4}$

D) $-\frac{7}{4}$

E) $-\frac{9}{4}$

3. $\lim\limits_{x \to y} \dfrac{x\sqrt{x}-y\sqrt{y}}{\sqrt{x}-\sqrt{y}} = ?$

A) 3y

B) 2y

C) y

D) –y

E) –2y

4. $\lim\limits_{x \to 3} \dfrac{\sqrt{x^2-9}+\sqrt{x-3}}{\sqrt{x-3}} = ?$

A) $\sqrt{2}+1$

B) $\sqrt{3}+1$

C) $\sqrt{6}+1$

D) $\sqrt{3}+2$

E) $\sqrt{6}+2$

5. $\lim\limits_{x \to 0} \dfrac{\sin x}{3x} = ?$

A) 0

B) $\frac{1}{3}$

C) 1

D) 3

E) ∞

6. $\lim\limits_{x \to 4} \dfrac{\sin(x-4)}{x^2-16} = ?$

A) $\frac{1}{4}$

B) $\frac{1}{5}$

C) $\frac{1}{6}$

D) $\frac{1}{7}$

E) $\frac{1}{8}$

7. $\lim\limits_{x \to 0} \dfrac{\sin^3 x + \sin x^3}{x^3} = ?$

A) –2

B) –1

C) 0

D) 1

E) 2

8. $\lim\limits_{x \to -1} \dfrac{3x^2 + ax - 2}{x^2 - 1} = b \in R \Rightarrow a = ?$

A) –1

B) 0

C) 1

D) 2

E) 3

9. $\lim\limits_{x \to 0} \dfrac{\sin x + \tan 2x}{3x} = ?$

A) $\dfrac{1}{3}$

B) $\dfrac{2}{3}$

C) 1

D) $\dfrac{4}{3}$

E) $\dfrac{5}{3}$

10. $\lim\limits_{x \to \frac{\pi}{4}} \dfrac{\cos x - \sin x}{\cos 2x} = ?$

A) $-\dfrac{\sqrt{2}}{2}$

B) $-\dfrac{1}{2}$

C) 0

D) $\dfrac{1}{2}$

E) $\dfrac{\sqrt{2}}{2}$

11. $\lim\limits_{x \to 3} \dfrac{\sin(3x-9)}{12x-36} = ?$

A) 0

B) 1

C) $\dfrac{1}{2}$

D) $\dfrac{1}{3}$

E) $\dfrac{1}{4}$

12. $\lim\limits_{x \to 0} \dfrac{\cos 2x + \sin x - 1}{x} = ?$

A) 0

B) 1

C) 2

D) 3

E) 4

YANITLAR / ANSWERS

1. B	2. C	3. A	4. C	5. B	6. E	7. E	8. C
9. C	10. E	11. E	12. B				

1. $\lim\limits_{x\to -2} \dfrac{x^2-4}{x+2} = ?$

A) –4 B) –2 C) 1 D) 2 E) 4

2. $\lim\limits_{x\to 0} \dfrac{\sin(\tan x)}{\sin x} = ?$

A) –1 B) 0 C) 1 D) 2 E) $\dfrac{\pi}{2}$

3. $\lim\limits_{x\to \frac{\pi}{2}} \dfrac{\sin(\cos x)}{\cos x} = ?$

A) –1 B) 0 C) 1 D) $\dfrac{\pi}{2}$ E) $\dfrac{2}{\pi}$

4. $\lim\limits_{x\to \pi} \dfrac{\cos x+1}{\sin x} = ?$

A) –2 B) –1 C) 0 D) 1 E) 2

5. $\lim\limits_{x\to 0} \dfrac{\cos^2 x-1}{\sin x} = ?$

A) –2 B) –1 C) 0 D) 1 E) 2

6. $\lim\limits_{x\to 1} \dfrac{\sin(x-1)}{x^3-1} = ?$

A) $\dfrac{1}{2}$ B) $\dfrac{1}{3}$ C) $\dfrac{1}{4}$ D) $\dfrac{1}{5}$ E) $\dfrac{1}{6}$

7. $\lim\limits_{x \to \infty} \dfrac{\sqrt{4x^2 - x + 5} + x}{3x - 2} = ?$

A) 1 B) $\frac{4}{3}$ C) $\frac{5}{3}$

D) 2 E) $\frac{7}{3}$

8. $\lim\limits_{x \to \infty} \left(\dfrac{1}{x^2} + \dfrac{2}{x^2} + \dfrac{3}{x^2} + \ldots + \dfrac{x-1}{x^2} \right) = ?$

A) 0

B) $\frac{1}{3}$

C) $\frac{1}{4}$

D) $\frac{1}{5}$

E) ∞

9. $\lim\limits_{x \to 3} \left(\log_3(6x-9) - \log_3(2x-3) \right) = ?$

A) 1 B) 3 C) 6

D) 9 E) ∞

10. $\lim\limits_{x \to \infty} x \cdot \sin\dfrac{1}{x} = ?$

A) 0 B) $\frac{1}{2}$ C) 1

D) 2 E) ∞

11. $\lim\limits_{x \to \infty} \left(1 + \dfrac{2}{x} \right)^{3x} = ?$

A) e^2 B) e^4 C) e^6

D) e^8 E) e^{10}

12. $\lim\limits_{x \to \infty} \left(1 + \dfrac{x-3}{x^2+4} \right)^{3x} = ?$

A) 1 B) e C) e^2

D) e^3 E) e^4

YANITLAR / ANSWERS

1. A 2. C 3. C 4. C 5. C 6. B 7. A 8. A
9. A 10. C 11. C 12. D

1. $\lim\limits_{x \to y} \dfrac{x^2 - y^2}{x - y} = ?$

A) –2y B) –y C) 0 D) y E) 2y

2. $\lim\limits_{x \to 0} \dfrac{9^x - 1}{3^x - 1} = ?$

A) 1 B) 2 C) 4 D) 6 E) 12

3. $\lim\limits_{x \to 3^-} \dfrac{|x^2 - x - 6|}{x - 3} = ?$

A) –7 B) –6 C) –5 D) –4 E) –3

4. $\lim\limits_{x \to 0} \dfrac{\sin 4x \cdot \cos 4x}{2x} = ?$

A) –2 B) –1 C) 0 D) 1 E) 2

5. $\lim\limits_{x \to \pi} \dfrac{\sin x \cdot \sin 3x}{\cos 4x - \cos 2x} = ?$

A) 0 B) $-\dfrac{1}{2}$ C) -1 D) $-\dfrac{3}{2}$ E) -2

6. $\lim\limits_{x \to -\infty} \dfrac{\sqrt{x^2 - x + 4} + 3x}{2x - 3} = ?$

A) 1 B) $\dfrac{3}{2}$ C) 2 D) $\dfrac{5}{2}$ E) 3

7. $\lim\limits_{x\to\infty}\left(\dfrac{3x}{|x+3|}+\dfrac{4x+1}{|-2x|}\right)=?$

A) 1
B) 3
C) 5
D) 7
E) 9

8. $\lim\limits_{x\to\infty}\dfrac{3^x-4^{x+1}}{3^x+4^{x+1}}=?$

A) -1
B) $-\dfrac{1}{2}$
C) $-\dfrac{1}{3}$
D) $-\dfrac{1}{4}$
E) $-\dfrac{1}{5}$

9. $\lim\limits_{x\to\infty}\left(\sqrt{x+4}-\sqrt{x+3}\right)=?$

A) -1
B) 0
C) 1
D) 2
E) 3

10. $\lim\limits_{x\to 0}\left[(\cos x-1)\cdot\cot^2 x\right]=?$

A) -2
B) -1
C) $-\dfrac{1}{2}$
D) $-\dfrac{1}{4}$
E) 0

11. $\lim\limits_{x\to\infty}\left(1+\dfrac{4x}{x^2+3}\right)^{2x}=?$

A) e^2
B) e^4
C) e^6
D) e^8
E) e^{10}

12. $\lim\limits_{x\to\infty}\left(\dfrac{x+3}{x-5}\right)^{3x}=?$

A) e^{24}
B) e^{20}
C) e^{16}
D) e^{18}
E) e^{12}

YANITLAR / ANSWERS

1. E	2. B	3. C	4. E	5. B	6. A	7. C	8. A
9. B	10. C	11. D	12. A				

1. $\lim\limits_{x \to 1} \dfrac{x^3 - 3x^2 + x + 1}{x^2 + 3x - 4} = ?$

A) $-\frac{1}{5}$ B) $-\frac{2}{5}$ C) $-\frac{3}{5}$

D) $-\frac{4}{5}$ E) 1

2. $\lim\limits_{x \to 0} \dfrac{\sin x + \tan 3x}{x} = ?$

A) 1 B) 2 C) 3

D) 4 E) 5

3. $\lim\limits_{x \to 0} \dfrac{\tan^2 2x}{x^2} = ?$

A) 1 B) 2 C) 4

D) 6 E) 8

4. $\lim\limits_{x \to \infty} \left(\dfrac{3^{x+1} - 5^x}{3^{x+2} - 5^{x+1}} \right) = ?$

A) 0 B) $\frac{1}{2}$ C) $\frac{1}{3}$

D) $\frac{1}{4}$ E) $\frac{1}{5}$

5. $\lim\limits_{x \to \infty} \dfrac{3x^3 - x^2 + x - 5}{x^4 - x^2 + 1} = ?$

A) 0 B) 1 C) 2

D) 4 E) 5

6. $\lim\limits_{x \to \infty} \dfrac{\sqrt{9x^2 - x + 5} + x}{2x - 3} = ?$

A) 1

B) 2

C) 3

D) 4

E) 5

7. $\lim\limits_{x\to\infty}\left(\log_{10}\sqrt{10x^2+3}-\log_{10}\sqrt{x^2-x+1}\right)=?$

A) 0

B) 1

C) $\frac{1}{2}$

D) $\sqrt{10}$

E) ∞

8. $\lim\limits_{x\to-\infty}\left(\sqrt{4x^2-2x+3}+x\right)=?$

A) $-\infty$

B) -2

C) 0

D) 2

E) ∞

9. $\lim\limits_{x\to\frac{\pi}{2}}\left[(1-\sin x)\cdot\tan^2 x\right]=?$

A) $\frac{1}{2}$

B) 1

C) $\frac{3}{2}$

D) 2

E) 4

10. $\lim\limits_{x\to\infty}\left(\frac{x^2+7}{x^2+3}\right)^{2x^2}=?$

A) e^7 B) e^8 C) e^{10}

D) e^{14} E) e^{16}

11. $\lim\limits_{x\to\infty}\left(1+\frac{3x}{x^2-3}\right)^{x}=?$

A) e

B) e^2

C) e^3

D) e^4

E) e^5

12. $\lim\limits_{x\to 0} x^x=?$

A) Limit yoktur. / *There is not limit.*

B) 3

C) 2

D) 1

E) 0

YANITLAR / ANSWERS

1. B	2. D	3. C	4. E	5. A	6. B	7. C	8. E
9. A	10. B	11. C	12. D				

1. $f(x) = ax^2 - 3x + 1$

$\frac{d}{dx} f(x)\Big|_{x=1} = 5 \Rightarrow \mathbf{a = ?}$

A) 6
B) 5
C) 4
D) 3
E) 2

---

2. $\left.\begin{array}{l} f(x) = x^3 - ax^2 + bx + 3 \\ f(1) = 12 \\ f'(2) = 8 \end{array}\right\} \Rightarrow \mathbf{b = ?}$

A) 4
B) 6
C) 8
D) 12
E) 16

---

3. $f(x) = \frac{x^2 - 3x}{3x + 1} \Rightarrow \mathbf{f'(1) = ?}$

A) $-\frac{3}{16}$
B) $\frac{1}{8}$
C) $\frac{1}{16}$
D) $\frac{3}{16}$
E) $\frac{5}{16}$

---

4. $f(x) = (x+1)^2 \cdot (3x+1)^2 \Rightarrow \frac{\mathbf{df(x)}}{\mathbf{dx}}\Big|_{x=1} = \mathbf{?}$

A) 96
B) 120
C) 144
D) 156
E) 160

---

5. $f(x) = \frac{\sqrt{x}}{1 + \sqrt{x}} \Rightarrow \frac{\mathbf{df(x)}}{\mathbf{dx}}\Big|_{x=4} = \mathbf{?}$

A) 12
B) 1
C) $\frac{1}{36}$
D) $\frac{1}{16}$
E) $\frac{1}{12}$

---

6. $f(3x) = x^2 \cdot g(x - 2)$,

$f'(3) = 2$,

$g(-1) = 4 \Rightarrow \mathbf{g'(-1) = ?}$

A) 3
B) 2
C) -2
D) -3
E) -4

7. $f(x) = (x^2 - x)^{-2} \Rightarrow$ **$f'(2) = ?$**

A) -4 B) $-\frac{8}{3}$ C) $-\frac{3}{4}$

D) $\frac{1}{4}$ E) $\frac{1}{2}$

8. $f(x) = x^3 - 6x + g(4x - 7)$

$g'(5) = -3$

$\Rightarrow$ **$f'(3) = ?$**

A) -6 B) -3 C) 0

D) 6 E) 9

9. $f(x) = x \cdot \sqrt{x^3 + 8} \Rightarrow$ **$f'(2) = ?$**

A) $\frac{4}{9}$ B) $\frac{5}{2}$ C) 5

D) $\frac{13}{2}$ E) 7

10. $f(4) = -3$,

$f'(4) = 2$,

$g'(-3) = -5 \Rightarrow$ **$(gof)'(4) = ?$**

A) -16 B) -14 C) -12

D) -10 E) -8

11. $f(x) = \frac{x^3 - 1}{x} \Rightarrow$ **$f'(x) = ?$**

A) $3x + \frac{1}{x}$ B) $2x + \frac{1}{x^2}$ C) $3x - \frac{1}{x^2}$

D) $4x + \frac{1}{x^2}$ E) $3x + \frac{1}{x^2}$

12. $a < 0$,

$f(x) = \frac{1}{3}x^3 + x^2 - 3x + 7$

$\frac{d}{dx}f(x)\Big|_{x=a} = 0 \Rightarrow$ **$a = ?$**

A) -4 B) -3 C) -2

D) 1 E) 6

YANITLAR / ANSWERS							
1. C	**2. D**	**3. B**	**4. E**	**5. C**	**6. C**	**7. C**	**8. E**
9. E	**10. D**	**11. B**	**12. B**				

1. $f(x) = ax^2 - 3x + 1$

$f'(x) = 2ax - 3$

$f'(1) = 2a \cdot 1 - 3 = 5$

$5 = 2a - 3$

$2a = 8$

$a = 4$

Yanıt / The Answer is C

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2. $f(x) = x^3 - ax^2 + bx + 3$

$f(1) = 1 - a + b + 3 = 12 \Rightarrow b - a = 8$

$f'(x) = 3x^2 - 2ax + b$

$f'(2) = 12 - 4a + b = 8 \Rightarrow 4a - b = 4$

$$\left.\begin{array}{r} b - a = 8 \\ 4a - b = 4 \end{array}\right\} \Rightarrow b = 12$$

Yanıt / The Answer is D

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3. $f(x) = \dfrac{x^2 - 3x}{3x + 1}$

$$\Rightarrow f'(x) = \frac{(x^2 - 3x)' \cdot (3x + 1) - (3x + 1)' \cdot (x^2 - 3x)}{(3x + 1)^2}$$

$$= \frac{(2x - 3) \cdot (3x + 1) - 3 \cdot (x^2 - 3x)}{(3x + 1)^2}$$

$$f'(1) = \frac{(2 \cdot 1 - 3)(3 \cdot 1 + 1) - 3 \cdot (1 - 3)}{(3 \cdot 1 + 1)^2}$$

$$= \frac{-1 \cdot 4 + 6}{16} = \frac{1}{8}$$

Yanıt / The Answer is B

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4. $f(x) = (x + 1)^2 \cdot (3x + 1)^2$

$$\frac{df(x)}{dx} = \left((x + 1)^2\right)' \cdot (3x + 1)^2 + \left((3x + 1)^2\right)' \cdot (x + 1)^2$$

$$= (2x + 2) \cdot (3x + 1)^2 + (18x + 6) \cdot (x + 1)^2$$

$$\left.\frac{df(x)}{dx}\right|_{x=1} = (2 + 2) \cdot (3 + 1)^2 + (18 + 6) \cdot (1 + 1)^2$$

$$= 4 \cdot 16 + 24 \cdot 4 = 160$$

Yanıt / The Answer is E

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5. $f(x) = \dfrac{\sqrt{x}}{1 + \sqrt{x}}$

$$f'(x) = \frac{(\sqrt{x})' \cdot (1 + \sqrt{x}) - (1 + \sqrt{x})' \cdot \sqrt{x}}{(1 + \sqrt{x})^2}$$

$$= \frac{\frac{1}{2\sqrt{x}} \cdot (1 + \sqrt{x}) - \frac{1}{2\sqrt{x}} \cdot \sqrt{x}}{(1 + \sqrt{x})^2}$$

$$f'(4) = \frac{\frac{1}{4} \cdot 3 - \frac{1}{4} \cdot 2}{9}$$

$$= \frac{\frac{3}{4} - \frac{1}{2}}{9} = \frac{1}{36}$$

Yanıt / The Answer is C

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6. $f(3x) = x^2 \cdot g(x - 2) \Rightarrow$

$(3x)' \cdot f'(3x) = (x^2)' \cdot g(x - 2) + g'(x - 2) \cdot x^2$

$3 \cdot f'(3x) = 2x \cdot g(x - 2) + g'(x - 2) \cdot x^2$

$3 \cdot f'(3) = 2 \cdot 1 \cdot g(1 - 2) + g'(1 - 2) \cdot 1^2$

$$\left.\begin{array}{r} g(-1) = 4 \\ f'(3) = 2 \end{array}\right\} \Rightarrow 3 \cdot 2 = 2 \cdot 4 + g'(-1) \cdot 1$$

$$6 = 8 + g'(-1) \cdot 1 \Rightarrow g'(-1) = -2$$

Yanıt / The Answer is C

7. $f(x) = (x^2 - x)^{-2}$

$f'(x) = -2\cdot(x^2 - x)'\cdot(x^2 - x)^{-3}$

$= -2\cdot(2x - 1)\cdot(x^2 - x)^{-3}$

$f'(2) = -2\cdot 3\cdot 2^{-3}$

$= -\frac{3}{4}$

Yanıt / The Answer is C

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8. $f(x) = x^3 - 6x + g(4x - 7)$

$f'(x) = 3x^2 - 6 + g'(4x - 7)\cdot(4x - 7)'$

$= 3x^2 - 6 + 4\cdot g'(4x - 7)$

$g'(5) = -3 \Rightarrow f'(3) = 3\cdot 3^2 - 6 + 4\cdot g'(5)$

$= 21 + 4\cdot(-3) = 9$

Yanıt / The Answer is E

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9. $f(x) = x\cdot\sqrt{x^3+8}$

$f'(x) = (x)'\cdot\sqrt{x^3+8} + x\cdot(\sqrt{x^3+8})'$

$= \sqrt{x^3+8} + x\cdot\frac{3x^2}{2\cdot\sqrt{x^3+8}}$

$f'(2) = \sqrt{2^3+8} + 2\cdot\frac{3\cdot 2^2}{2\cdot\sqrt{2^3+8}}$

$= 4 + 2\cdot\frac{12}{8} = 7$

Yanıt / The Answer is E

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10. $(gof)'(x) = g'(f(x))\cdot f'(x)$

$(gof)'(4) = g'(f(4))\cdot f'(4)$

$= g'(-3)\cdot 2$

$= (-5)\cdot 2$

$= -10$

Yanıt / The Answer is D

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11. $f(x) = \frac{x^3 - 1}{x}$

$f(x) = \frac{x^3}{x} - \frac{1}{x}$

$f(x) = x^2 - x^{-1}$

$f'(x) = 2x + x^{-2}$

$f'(x) = 2x + \frac{1}{x^2}$

Yanıt / The Answer is B

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12. $f(x) = \frac{1}{3}x^3 + x^2 - 3x + 7$

$\frac{df(x)}{dx} = \frac{1}{3}\cdot 3x^2 + 2x - 3$

$= x^2 + 2x - 3$

$\left.\frac{df(x)}{dx}\right|_{x=a} = a^2 + 2a - 3 = 0$

$(a+3)\cdot(a-1) = 0$

$a < 0 \Rightarrow a = -3$

Yanıt / The Answer is B

1. $f(x) = \cos 2x \Rightarrow \lim\limits_{h \to 0} \dfrac{f\left(\frac{\pi}{6}+h\right) - f\left(\frac{\pi}{6}\right)}{h} = ?$

A) $-\sqrt{3}$

B) $-\dfrac{1}{\sqrt{3}}$

C) 1

D) 2

E) $\sqrt{3}$

---

2. $f(x) = \sin^2 \sqrt{x} \Rightarrow \dfrac{df(x)}{dx} = f'(x) = ?$

A) $\dfrac{1}{2\sqrt{x}} \sin 2\sqrt{x}$

B) $\dfrac{1}{\sqrt{x}} \sin 2\sqrt{x}$

C) $\dfrac{1}{2\sqrt{x}} \sin \sqrt{x}$

D) $\dfrac{1}{2\sqrt{x}} \sin 2\sqrt{x} \cdot \cos \sqrt{x}$

E) $\dfrac{1}{4\sqrt{x}} \sin 2\sqrt{x}$

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3. $f(x) = 3\sin(3x + 5) \Rightarrow f'(7°) = ?$

A) 3 cos 26°

B) 9 cos 26°

C) 15 cos 26°

D) 3 sin 26°

E) –sin 26°

4. $f(x) = \dfrac{x \cdot \sin x}{1 + \tan x} \Rightarrow f'\left(\dfrac{\pi}{4}\right) = ?$

A) $\sqrt{2}$

B) $\dfrac{\sqrt{2}}{2}$

C) $\dfrac{\sqrt{2}}{4}$

D) $-\sqrt{2}$

E) -2

---

5. $f(x) = x \cdot \sin x \Rightarrow \left.\dfrac{d^2 f(x)}{dx^2}\right|_{x=\frac{\pi}{2}} = ?$

A) -1

B) 0

C) 1

D) $\dfrac{\pi}{2}$

E) $-\dfrac{\pi}{2}$

---

6. $f(x) = \dfrac{1-\cos 2x}{1+\cos 2x} \Rightarrow f'\left(\dfrac{\pi}{3}\right) = ?$

A) $8\sqrt{3}$

B) $4\sqrt{3}$

C) $\dfrac{2\sqrt{3}}{3}$

D) $\dfrac{\sqrt{3}}{3}$

E) 6

7. $f(x)=\tan\left(\frac{\pi}{2}\cos x\right) \Rightarrow \mathbf{f'\left(\frac{\pi}{3}\right)=?}$

A) $-\frac{\pi\sqrt{3}}{2}$

B) $-\frac{\pi}{2}$

C) 0

D) π

E) $\frac{\pi\sqrt{3}}{2}$

---

8. $f(x)=x\cdot\sin\frac{1}{x} \Rightarrow \left.\frac{\mathbf{df(x)}}{\mathbf{dx}}\right|_{x=\frac{2}{\pi}}=\mathbf{?}$

A) -1

B) $-\frac{1}{2}$

C) 0

D) $\frac{1}{2}$

E) 1

---

9. $f(x)=\arcsin\frac{x-1}{3} \Rightarrow \mathbf{f'(1)=?}$

A) $\frac{1}{\sqrt{3}}$

B) $\frac{1}{3}$

C) $\frac{1}{3\sqrt{3}}$

D) $\frac{\sqrt{3}}{6}$

E) $\frac{1}{9}$

---

10. $f(x)=\arctan(\sin x)$

$\cos a=\frac{2}{5} \Rightarrow \mathbf{f'(a)=?}$

A) $\frac{7}{24}$

B) $\frac{5}{23}$

C) $\frac{3}{20}$

D) $\frac{2}{9}$

E) $\frac{1}{25}$

---

11. $f(x)=\arccos\sqrt{1-4x} \Rightarrow \mathbf{f'(x)=?}$

A) $-2\sqrt{4x^2}$

B) $-x\sqrt{x+4x^2}$

C) $\frac{-2}{\sqrt{x-4x^2}}$

D) $\frac{1}{\sqrt{x-4x^2}}$

E) $-\sqrt{x+4x^2}$

---

12. $f(x)=\operatorname{arccot}(\cot(x)) \Rightarrow \mathbf{f'(1)=?}$

A) -1

B) 0

C) 1

D) $\frac{3}{4}$

E) $\frac{9}{4}$

YANITLAR / ANSWERS

1. A	**2. A**	**3. B**	**4. C**	**5. E**	**6. A**	**7. A**	**8. E**
9. B	**10. B**	**11. D**	**12. C**				

1. $$\lim_{h\to 0}\frac{f\left(\frac{\pi}{6}+h\right)-f\left(\frac{\pi}{6}\right)}{h}=f'\left(\frac{\pi}{6}\right)$$

$$f(x)=\cos 2x \Rightarrow f'(x)=-2\cdot\sin 2x$$

$$f'\left(\frac{\pi}{6}\right)=-2\cdot\sin\left(2\cdot\frac{\pi}{6}\right)$$

$$=-2\cdot\frac{\sqrt{3}}{2}$$

$$=-\sqrt{3}$$

Yanıt / The Answer is A

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2. $$f(x)=\sin^2\sqrt{x}$$

$$f'(x)=2\cdot\sin\sqrt{x}\cdot\cos\sqrt{x}\cdot(\sqrt{x})'$$

$$=2\cdot\sin\sqrt{x}\cdot\cos\sqrt{x}\cdot\frac{1}{2\sqrt{x}}$$

$$=\sin 2\sqrt{x}\cdot\frac{1}{2\sqrt{x}}$$

Yanıt / The Answer is A

---

3. $f(x) = 3\cdot\sin(3x + 5)$

$f'(x) = 3\cdot(\sin(3x + 5))'$

$= 3\cdot(3x + 5)'\cdot\cos(3x + 5)$

$= 9\cdot\cos(3x + 5)$

$\Rightarrow f'(7°) = 9\cdot\cos 26°$

Yanıt / The Answer is B

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4. $$f(x)=\frac{x\cdot\sin x}{1+\tan x}$$

$$f'(x)=\frac{(x\cdot\sin x)'\cdot(1+\tan x)-(1+\tan x)'\cdot x\cdot\sin x}{(1+\tan x)^2}$$

$$f'\left(\frac{\pi}{4}\right)=\frac{\left(\frac{\sqrt{2}}{2}+\frac{\sqrt{2}}{2}\cdot\frac{\pi}{4}\right)\cdot 2-2\cdot\left(\frac{\pi}{4}\cdot\frac{\sqrt{2}}{2}\right)}{4}$$

$$=\frac{\sqrt{2}+\sqrt{2}\cdot\frac{\pi}{4}-\sqrt{2}\cdot\frac{\pi}{4}}{4}=\frac{\sqrt{2}}{4}$$

Yanıt / The Answer is C

---

5. $f(x) = x\cdot\sin x$

$f'(x) = (x)'\cdot\sin x + (\sin x)'\cdot x = \sin x + \cos x\cdot x$

$f''(x) = \cos x + (\cos x)'\cdot x + (x)'\cdot\cos x$

$= \cos x + (-\sin x)\cdot x + \cos x$

$$f''\left(\frac{\pi}{2}\right)=0-\frac{\pi}{2}+0=-\frac{\pi}{2}$$

Yanıt / The Answer is E

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6. $$f(x)=\frac{1-\cos 2x}{1+\cos 2x}=\frac{1-(1-2\sin^2 x)}{1+(2\cos^2 x-1)}$$

$$=\frac{2\sin^2 x}{2\cos^2 x}=\tan^2 x$$

$$f(x)=\tan^2 x \Rightarrow f'(x)=2\cdot\tan x\cdot(1+\tan^2 x)$$

$$f'\left(\frac{\pi}{3}\right)=2\cdot\tan\frac{\pi}{3}\cdot\left(1+\tan^2\frac{\pi}{3}\right)$$

$$=2\cdot\sqrt{3}\cdot(1+3)=8\sqrt{3}$$

Yanıt / The Answer is A

7. $f(x)=\tan\left(\frac{\pi}{2}\cos x\right)$

$$f'(x)=\left(\frac{\pi}{2}\cos x\right)'\cdot\left(1+\tan^2\left(\frac{\pi}{2}\cos x\right)\right)$$

$$=-\frac{\pi}{2}\sin x\cdot\left(1+\tan^2\left(\frac{\pi}{2}\cos x\right)\right)$$

$$f'\left(\frac{\pi}{3}\right)=-\frac{\pi}{2}\cdot\frac{\sqrt{3}}{2}\cdot\left(1+\tan^2\left(\frac{\pi}{2}\cdot\frac{1}{2}\right)\right)$$

$$=\frac{-\sqrt{3}\,\pi}{4}\cdot(1+1)=\frac{-\sqrt{3}\,\pi}{2}$$

Yanıt / The Answer is A

8. $f(x)=x\cdot\sin\frac{1}{x}$

$$f'(x)=(x)'\cdot\sin\frac{1}{x}+\left(\sin\frac{1}{x}\right)'\cdot x$$

$$=\sin\frac{1}{x}-\frac{1}{x^2}\cos\frac{1}{x}x$$

$$=\sin\frac{1}{x}-\frac{1}{x}\cos\frac{1}{x}$$

$$f'\left(\frac{2}{\pi}\right)=\sin\frac{\pi}{2}-\frac{2}{\pi}\cdot\cos\frac{\pi}{2}=1-0=1$$

Yanıt / The Answer is E

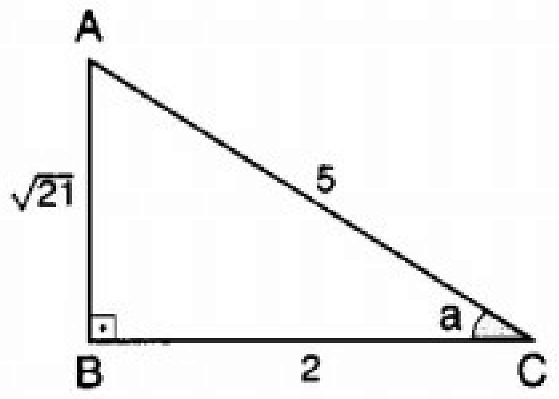
9. $f(x)=\arcsin\frac{x-1}{3}$

$$f'(x)=\frac{\left(\frac{x-1}{3}\right)'}{\sqrt{1-\left(\frac{x-1}{3}\right)^2}}=\frac{\frac{1}{3}}{\sqrt{1-\left(\frac{x-1}{3}\right)^2}}$$

$$f'(1)=\frac{\frac{1}{3}}{\sqrt{1-\left(\frac{1-1}{3}\right)^2}}=\frac{1}{3}$$

Yanıt / The Answer is B

10. $f(x)=\arctan(\sin x)$



$$f'(x)=\frac{(\sin x)'}{1+\sin^2 x}=\frac{\cos x}{1+\sin^2 x}$$

$$\cos a=\frac{2}{5}\Rightarrow\sin a=\frac{\sqrt{21}}{5}$$

$$f(a)=\frac{\cos a}{1+\sin^2 a}=\frac{\frac{2}{5}}{1+\frac{21}{25}}=\frac{\frac{2}{5}}{\frac{46}{25}}$$

$$f(a)=\frac{5}{23}$$

Yanıt / The Answer is B

11. $f(x)=\arccos\sqrt{1-4x}$

$$f'(x)=\frac{(\sqrt{1-4x})'}{\sqrt{1-(\sqrt{1-4x})^2}}=-\frac{-\frac{4}{2\cdot\sqrt{1-4x}}}{\sqrt{1-1+4x}}$$

$$=\frac{4}{2\cdot\sqrt{4x-16x^2}}$$

$$=\frac{2}{\sqrt{4x-16x^2}}=\frac{1}{\sqrt{x-4x^2}}$$

Yanıt / The Answer is D

12. $f(x)=\operatorname{arccot}(\cot(x))=x\Rightarrow f'(x)=1$

Yanıt / The Answer is C

1. $f(x) = \ln\cos x \Rightarrow f'(x) = ?$

A) $\sin x$
B) $\cot x$
C) $-\cot x$
D) $-\tan x$
E) $\tan x$

---

2. $f(x) = (x^2)^{\sin x} \Rightarrow f'\left(\frac{\pi}{2}\right) = ?$

A) 0
B) 1
C) π
D) 2π
E) 6π

---

3. $y = \sqrt{4 + \ln x} \Rightarrow \frac{dy}{dx} = ?$

A) $\frac{1}{2x\sqrt{4+\ln x}}$
B) $\frac{1}{2x\sqrt{4-\ln x}}$
C) $\frac{1}{4x\sqrt{4+\ln x}}$
D) $\frac{1}{4x\sqrt{4-\ln x}}$
E) $\frac{1}{x\sqrt{4+\ln x}}$

---

4. $f(x) = 3^{\cos x} \Rightarrow f'\left(\frac{\pi}{2}\right) = ?$

A) $-\ln 6$
B) $-\ln 3$
C) $\ln 2$
D) $\ln 3$
E) $\ln 6$

---

5. $y = \log_2 x^2 \Rightarrow \frac{dy}{dx} = ?$

A) $\frac{2+x}{\ln 2}$
B) $\frac{2}{x \cdot \ln 2}$
C) $\frac{1}{x \cdot \ln 2}$
D) $\frac{x \cdot \ln 2}{x + \ln 2}$
E) $\frac{\ln 2}{x + \ln 2}$

---

6. $f(x) = 5^x - 8^x \Rightarrow f'(0) = ?$

A) $\ln\frac{3}{8}$
B) $\ln\frac{1}{2}$
C) $\ln\frac{5}{8}$
D) $\ln\frac{3}{4}$
E) $\ln\frac{7}{8}$

7. $f(x) = (2x-1)^3 \cdot \ln x \Rightarrow$ **$f'(1) = ?$**

A) -2

B) -1

C) 0

D) 1

E) 2

8. $f(x) = \sqrt{e^x} \cdot \ln x^2 \Rightarrow$ **$f'(1) = ?$**

A) $\frac{2}{\sqrt{e}}$

B) $\frac{4}{\sqrt{e}}$

C) $2\sqrt{e}$

D) $3\sqrt{e}$

E) $4\sqrt{e}$

9. $f(x) = \ln(\arctan x) \Rightarrow$ **$f'(1) = ?$**

A) $\frac{\pi}{3}$

B) $\frac{2}{\pi}$

C) $\frac{\pi}{4}$

D) $\frac{1}{2\pi}$

E) π

10. $f(x) = \log x^3 \Rightarrow$ **$f'\left(\frac{1}{\ln 10}\right) = ?$**

A) 3

B) 1

C) 0

D $3 \cdot \ln 10$

E) $(\ln 10)^2$

11. $f(x) = 5^{3x-3}$

$f'(a) = \ln 5^{375} \Rightarrow$ **$a = ?$**

A) 4

B) 3

C) 0

D) 1

E) 2

12. $f(x) = \log_a (x^2 + 3x + 1)$

$\frac{d}{d(x)} f(x)\Big|_{x=1} = \frac{1}{6} \Rightarrow$ **$a = ?$**

A) e^3

B) e^4

C) e^5

D) e^6

E) e^{30}

YANITLAR / ANSWERS

1. D	2. C	3. A	4. B	5. B	6. C	7. D	8. C
9. B	10. A	11. E	12. D				

1. $f(x) = \ln\cos x$

$$f'(x) = \frac{-\sin x}{\cos x}$$

$$f'(x) = -\tan x$$

Yanıt / The Answer is D

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2. $f(x) = (x^2)^{\sin x} = x^{2\sin x}$

$$y = x^{2\sin x}$$

$$\ln y = \ln x^{2\sin x} = 2\sin x \cdot \ln x$$

$$(\ln y)' = (2\sin x \cdot \ln x)'$$

$$\frac{y'}{y} = 2\cdot\cos x\cdot\ln x + \frac{1}{x}\cdot 2\sin x$$

$$\frac{y'}{x^{2\sin x}} = \left(2\cdot\cos x\cdot\ln x + \frac{1}{x}\cdot 2\sin x\right)$$

$$f'(x) = y' = x^{2\sin x}\cdot\left(2\cdot\cos x\cdot\ln x + \frac{1}{x}\cdot 2\sin x\right)$$

$$f'\left(\frac{\pi}{2}\right) = \left(\frac{\pi}{2}\right)^2\cdot(0 + \frac{2}{\pi}\cdot 2)$$

$$= \frac{\pi^2}{4}\cdot\frac{4}{\pi} = \pi$$

Yanıt / The Answer is C

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3. $y = \sqrt{4+\ln x}$

$$\frac{dy}{dx} = \frac{(4+\ln x)'}{2\sqrt{4+\ln x}}$$

$$= \frac{\frac{1}{x}}{2\sqrt{4+\ln x}} = \frac{1}{2x\sqrt{4+\ln x}}$$

Yanıt / The Answer is A

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4. $f(x) = 3^{\cos x}$

$$f'(x) = (\cos x)'\cdot 3^{\cos x}\cdot\ln 3$$

$$= -\sin x\cdot 3^{\cos x}\cdot\ln 3$$

$$f'\left(\frac{\pi}{2}\right) = -\sin\frac{\pi}{2}\cdot 3^{\cos\frac{\pi}{2}}\cdot\ln 3$$

$$= -1\cdot 1\cdot\ln 3 = -\ln 3$$

Yanıt / The Answer is B

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5. $y = \log_2 x^2$

$$\frac{dy}{dx} = \frac{(x^2)'}{x^2}\cdot\log_2 e$$

$$= \frac{2x}{x^2\cdot\ln 2}$$

$$= \frac{2}{x\cdot\ln 2}$$

Yanıt / The Answer is B

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6. $f(x) = 5^x - 8^x$

$$f'(x) = 5^x\cdot\ln 5 - 8^x\cdot\ln 8$$

$$f'(0) = \ln 5 - \ln 8$$

$$= \ln\frac{5}{8}$$

Yanıt / The Answer is C

7. $f(x) = (2x-1)^3 \cdot \ln x$

$$f'(x) = \left((2x-1)^3\right)' \ln x + (\ln x)' \cdot (2x-1)^3$$

$$= 3 \cdot (2x-1)^2 \cdot 2 \cdot \ln x + \frac{1}{x} \cdot (2x-1)^3$$

$$f'(1) = 3 \cdot 1^2 \cdot 2 \cdot \ln 1 + \frac{1}{1} \cdot 1^2$$

$$= 0 + 1 = 1$$

Yanıt / The Answer is D

8. $f(x) = \sqrt{e^x} \cdot \ln x^2$

$$f'(x) = \left(\sqrt{e^x}\right)' \ln x^2 + (\ln(x^2))' \cdot \sqrt{e^x}$$

$$= \frac{e^x}{2\sqrt{e^x}} \cdot \ln x^2 + \frac{2x}{x^2} \cdot \sqrt{e^x}$$

$$= \frac{e^x}{2\sqrt{e^x}} \cdot \ln x^2 + \frac{2}{x} \cdot \sqrt{e^x}$$

$$f'(1) = \frac{e}{2\sqrt{e}} \cdot \ln 1^2 + \frac{2}{1} \cdot \sqrt{e}$$

$$= 0 + 2\sqrt{e} = 2\sqrt{e}$$

Yanıt / The Answer is C

9. $f(x) = \ln(\arctan x)$

$$f'(x) = \frac{(\arctan x)'}{\arctan x} = \frac{\frac{1}{1+x^2}}{\arctan x}$$

$$f'(1) = \frac{\frac{1}{2}}{\frac{\pi}{4}} = \frac{2}{\pi}$$

Yanıt / The Answer is B

10. $f(x) = \log x^3$

$$f'(x) = \frac{(x^3)'}{x^3} \cdot \log_{10} e = \frac{3x^2}{x^3 \cdot \ln 10} = \frac{3}{x \cdot \ln 10}$$

$$f'\left(\frac{1}{\ln 10}\right) = \frac{3}{\frac{1}{\ln 10} \cdot \ln 10} = 3$$

Yanıt / The Answer is A

11. $f(x) = 5^{3x-3}$

$$f'(x) = (3x-3)' \cdot 5^{3x-3} \cdot \ln 5$$

$$= 3 \cdot 5^{3x-3} \cdot \ln 5$$

$$f'(a) = 3 \cdot 5^{3a-3} \cdot \ln 5 = 5^{3a-3} \cdot \ln 5^3$$

$$f'(a) = \ln(5)^{3 \cdot 5^{3a-3}} = \ln 5^{375}$$

$$3 \cdot 5^{3a-3} = 375$$

$$5^{3a-3} = 125 \Rightarrow a = 2$$

Yanıt / The Answer is E

12. $f(x) = \log_a (x^2 + 3x + 1)$

$$f'(x) = \frac{(x^2 + 3x + 1)'}{(x^2 + 3x + 1) \cdot \ln a}$$

$$= \frac{2x + 3}{(x^2 + 3x + 1) \cdot \ln a}$$

$$f'(1) = \frac{5}{5 \cdot \ln a} = \frac{1}{6} \Rightarrow a = e^6$$

Yanıt / The Answer is D

1. $\left.\begin{array}{l} y=3x^2-1 \\ z=2y^3+4 \end{array}\right\} \Rightarrow \dfrac{dz}{dx}=?$

A) $36x(3x^2-1)^2$

B) $6x\cdot(3x^2-1)^2$

C) $36\cdot(x^2-1)^2$

D) $x(3x^2-1)^2$

E) $18x(3x^2-1)$

2. $\left.\begin{array}{l} x=4t-t^2 \\ y=2t^2+t \end{array}\right\} \Rightarrow \dfrac{dy}{dx}=?$

A) $\dfrac{2t+4}{4t-2}$

B) $\dfrac{4t-1}{2t+4}$

C) $\dfrac{4t+1}{4-2t}$

D) $\dfrac{2t-4}{4t+1}$

E) $\dfrac{t^2-1}{4+2t}$

3. $\left.\begin{array}{l} y=t^3+t \\ x=t^3+1 \end{array}\right\} \Rightarrow \left.\dfrac{d^2y}{dx^2}\right|_{x=2}=?$

A) $-\dfrac{1}{9}$

B) $-\dfrac{2}{9}$

C) $-\dfrac{4}{9}$

D) $-\dfrac{7}{9}$

E) -1

4. $\left.\begin{array}{l} x=\ln t \\ y=t^2 \end{array}\right\} \Rightarrow \dfrac{d^2y}{dx^2}=?$

A) t

B) t^2

C) $2t^2$

D) $4t^2$

E) $8t^2$

5. $\left.\begin{array}{l} y=3x+2 \\ x=2t^2+1 \\ t=3u \end{array}\right\} \Rightarrow \left.\dfrac{dy}{du}\right|_{u=\frac{1}{3}}=?$

A) 3

B) 9

C) 15

D) 27

E) 36

6. $f(x)=\sin x \Rightarrow f^{(57)}(x)=?$

A) $\sin x$

B) $\cos x$

C) $-\sin x$

D) $-\cos x$

E) $\tan x$

7. $f(x)=\frac{1}{x} \Rightarrow f^{(15)}(1)=?$

A) 15!

B) 16!

C) −14!

D) −15!

E) −16!

8. $2x^2+3xy-4y^2=0 \Rightarrow \frac{dy}{dx}=?$

A) $\frac{4x-3y}{3x+8y}$

B) $\frac{-4x-3y}{3x-8y}$

C) $\frac{4x+3y}{3x+8y}$

D) $\frac{2x-3y}{3x+4y}$

E) $\frac{2x+3y}{3x-8y}$

9. $x^y+y^x+3=0 \Rightarrow \left.\frac{dy}{dx}\right|_{(1,1)}=?$

A) −3

B) −1

C) 0

D) 1

E) 3

10. $\lim\limits_{x\to\pi}\frac{1+\cos x}{\sin^2 x}=?$

A) $-\frac{1}{4}$

B) $-\frac{1}{2}$

C) 0

D) $\frac{1}{2}$

E) $\frac{1}{4}$

11. $\lim\limits_{x\to 1}\frac{x^3-2x^2+x}{2x-2}=?$

A) −2

B) −1

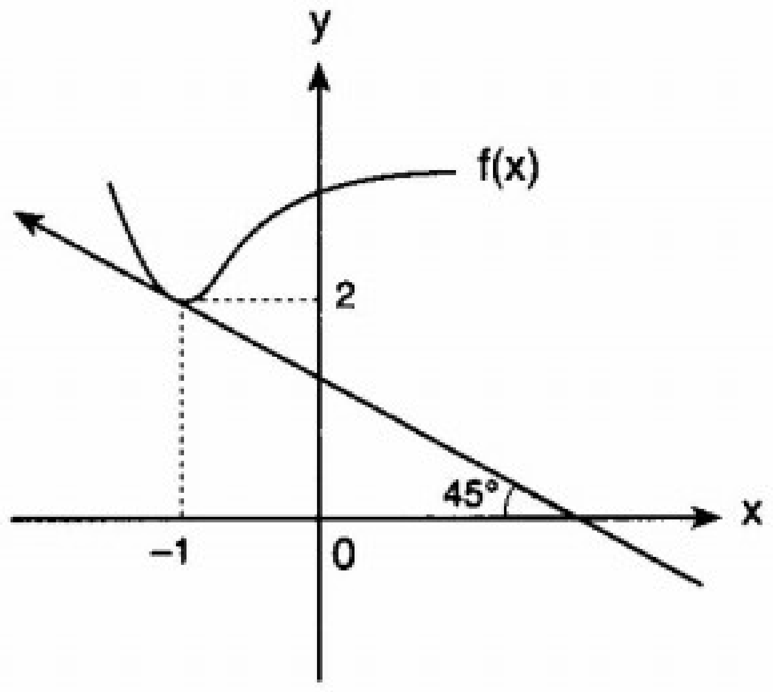
C) 0

D) 1

E) 2

12. $g(x)=3x\cdot f(x)$

$\Rightarrow g'(-1)=?$



A) 7

B) 8

C) 9

D) 10

E) 11

YANITLAR / ANSWERS

1. A	2. C	3. B	4. D	5. E	6. B	7. D	8. B
9. B	10. D	11. C	12. C				

1. $$\frac{dz}{dx} = \frac{dz}{dy} \cdot \frac{dy}{dx}$$

$$= 6y^2 \cdot 6x$$

$$= 36 \cdot y^2 \cdot x$$

$$= 36 \cdot (3x^2 - 1)^2 \cdot x$$

$$= 36x \cdot (3x^2 - 1)^2$$

Yanıt / The Answer is A

---

2. $$\frac{dy}{dx} = \frac{\dfrac{dy}{dt}}{\dfrac{dx}{dt}} = \frac{4t+1}{4-2t}$$

Yanıt / The Answer is C

---

3. $$\frac{d^2y}{dx^2} = \frac{y''(t) \cdot x'(t) - x''(t) \cdot y'(t)}{(x'(t))^3}$$

$$\left.\begin{array}{l} y'(t) = 3t^2 + 1 \\ y''(t) = 6t \\ x'(t) = 3t^2 \\ x''(t) = 6t \end{array}\right\} \Rightarrow \quad \frac{d^2y}{dx^2} = \frac{6t \cdot 3t^2 - 6t \cdot (3t^2 + 1)}{(3t^2)^3}$$

$$= \frac{18t^3 - 18t^3 - 6t}{27t^6} = \frac{-2}{9t^5}$$

$$x = 2 \Rightarrow t = 1 \Rightarrow \left.\frac{d^2y}{dx^2}\right|_{x=2} = -\frac{2}{9}$$

Yanıt / The Answer is B

---

4. $$\frac{d^2y}{dx^2} = \frac{y''(t) \cdot x'(t) - x''(t) \cdot y'(t)}{(x'(t))^3}$$

$$\left.\begin{array}{l} y'(t) = 2t \\ y''(t) = 2 \\ x'(t) = \dfrac{1}{t} \\ x''(t) = -\dfrac{1}{t^2} \end{array}\right\} \Rightarrow \quad \frac{d^2y}{dx^2} = \frac{2 \cdot \dfrac{1}{t} + \dfrac{1}{t^2} \cdot 2t}{\left(\dfrac{1}{t}\right)^3}$$

$$= \frac{\dfrac{4}{t}}{\dfrac{1}{t^3}} = 4t^2$$

Yanıt / The Answer is D

---

5. $$\frac{dy}{du} = \frac{dy}{dx} \cdot \frac{dx}{dt} \cdot \frac{dt}{dt}$$

$$= 3 \cdot 4t \cdot 3$$

$$= 36t \qquad \left[u = \frac{1}{3} \Rightarrow t = 1\right]$$

$$= 36$$

Yanıt / The Answer is E

---

6. $f(x) = \sin x$

$f'(x) = \cos x$

$f''(x) = -\sin x$

$f'''(x) = -\cos x$

$f^{(4)}(x) = \sin x$

$$\begin{array}{r|l} 57 & \underline{4} \\ -\,56 & 14 \\ \hline \textcircled{1} & \end{array}$$

$f^{(4)}(x) = f(x) \Rightarrow f^{(57)}(x) = \cos x$

Yanıt / The Answer is B

7. $f(x)=\frac{1}{x}=x^{-1}$

$f'(x)=-1\cdot x^{2}=-1!\cdot x^{2}$

$f''(x)=-1\cdot -2\cdot x^{-3}=2!\cdot x^{3}$

$f'''(x)=-1\cdot -2\cdot -3\cdot x^{-4}=-3!\cdot x^{4}$

$\vdots$

$f^{(15)}(x)=-15!\cdot x^{-16}$

$f^{(15)}(1)=-(15)\cdot(1)^{-16}=-15!$

Yanıt / The Answer is D

8. $2x^{2}+3xy-4y^{2}=0$

$$\frac{dy}{dx}=-\frac{f'_x}{f'_y}=-\frac{4x+3y}{3x-8y}$$

$$=\frac{-4x-3y}{3x-8y}$$

Yanıt / The Answer is B

9. $x^{y}+y^{x}+3=0$

$$\frac{dy}{dx}=-\frac{f'_x}{f'_y}=-\frac{y\cdot x^{y-1}+y^{x}\cdot \ln y}{x^{y}\cdot \ln x+x\cdot y^{x-1}}$$

$$\left.\frac{dy}{dx}\right|_{(1,1)}=-\frac{1\cdot x^{0}+1^{1}\cdot \ln 1}{1^{1}\cdot \ln 1+1\cdot 1^{0}}=-\frac{1}{1}=-1$$

Yanıt / The Answer is B

10. $\lim\limits_{x\to\pi}\frac{1+\cos x}{\sin^{2}x}\quad\left(\frac{0}{0}\right)$

$$\lim_{x\to\pi}\frac{-\sin x}{2\cdot\sin x\cdot\cos x}=\lim_{x\to\pi}\frac{-1}{2\cos x}=\frac{1}{2}$$

Yanıt / The Answer is D

11. $\lim\limits_{x\to 1}\frac{x^{3}-2x^{2}+x}{2x-2}\quad\left(\frac{0}{0}\right)$

$$\Rightarrow \lim_{x\to 1}\frac{3x^{2}-4x+1}{2}=0$$

Yanıt / The Answer is C

12. $g(x)=3x\cdot f(x)$

$g'(x)=3\cdot f(x)+3x\cdot f'(x)$

$g'(-1)=3\cdot f(-1)+(-3)\cdot f'(-1)$

$$\left.\begin{array}{l} f(-1)=2 \\ f'(-1)=\tan 135^\circ=-1 \end{array}\right\}\Rightarrow g'(-1)=3\cdot 2-3\cdot(-1)=6+3=9$$

Yanıt / The Answer is C

1. $f(x) = x^2 + \sqrt{x} \Rightarrow \mathbf{f'(9) = ?}$

Yanıt / The Answer is: $\mathbf{\frac{109}{6}}$

2. $f(x) = \frac{x}{x^2 - 1} \Rightarrow \mathbf{f'(2) = ?}$

Yanıt / The Answer is: $\mathbf{-\frac{5}{9}}$

3. $f(x) = (3 - 2x)^6 \Rightarrow \mathbf{f'(1) = ?}$

Yanıt / The Answer is: **–12**

4. $f(3x - 2) = x^3 - 3x + 1 \Rightarrow \mathbf{f'(4) = ?}$

Yanıt / The Answer is: **3**

5. $\left.\begin{aligned} f(x) &= \sqrt{x} \\ g(x) &= x^2 + 3 \end{aligned}\right\} \Rightarrow \mathbf{(fog)'(1) = ?}$

Yanıt / The Answer is: $\mathbf{\frac{1}{2}}$

6. $f(x) = x^4 - 3x^2 + 6x + 3 \Rightarrow \lim\limits_{x \to 1} \frac{f(x) - f(1)}{x - 1} = ?$

Yanıt / The Answer is: **4**

7. $f(x)=\sqrt{1+x^3} \Rightarrow \mathbf{f'(2)=?}$

Yanıt / The Answer is: **2**

8. $y=\sin^3 x \Rightarrow \mathbf{\frac{dy}{dx}=?}$

Yanıt / The Answer is: **$3\cdot\sin^2 x\cdot\cos x$**

9. $f(x)=\cos(\sin x) \Rightarrow \mathbf{f'\left(\frac{\pi}{2}\right)=?}$

Yanıt / The Answer is: **0**

10. $f(x)=e^{\sin x} \Rightarrow \mathbf{f'(0)=?}$

Yanıt / The Answer is: **1**

11. $f(x)=x\cdot e^x \Rightarrow \mathbf{f'(2)+f''(2)=?}$

Yanıt / The Answer is: **$7e^2$**

12. $f(x)=\arccos(2x+1) \Rightarrow \mathbf{f'\left(-\frac{1}{2}\right)=?}$

Yanıt / The Answer is: **–2**

13. $f(x) = (x^2 + 1) \cdot g(2x + 1)$

$g(5) = 6, \quad g'(5) = 3$

$\Rightarrow \mathbf{f'(2) = ?}$

Yanıt / The Answer is: **54**

14. $x = f(t) = t^3 - 1$

$y = g(t) = 2t^2 + 2t \quad \Rightarrow \quad \left.\dfrac{dy}{dx}\right|_{t=1} = ?$

Yanıt / The Answer is: **2**

15. $f(x) = \dfrac{\ln x}{x^2 + 1} \Rightarrow \left.\dfrac{df(x)}{dx}\right|_{x=1} = f'(1) = ?$

Yanıt / The Answer is: $\dfrac{1}{2}$

16. $f(x) = x(2 - \ln x) \Rightarrow \left.\dfrac{df(x)}{dx}\right|_{x=e} = ?$

Yanıt / The Answer is: **0**

17. $f(x) = \sin 6x \cdot \cos 6x \Rightarrow f'\left(\dfrac{\pi}{12}\right) = ?$

Yanıt / The Answer is: **–6**

18. $x^3 + 4xy^2 - y^4 - 27 = 0 \Rightarrow \dfrac{dy}{dx} = ?$

Yanıt / The Answer is: $\dfrac{3x^2 + 4y^2}{4y^3 - 8xy}$

19. $y = x^x \Rightarrow \dfrac{dy}{dx} = ?$

Yanıt / The Answer is: $\mathbf{x^x \cdot \ln(ex)}$

---

20. $f(x) = (x^2 + 1)\cdot\ln(2x + 1) \Rightarrow f'(1) = ?$

Yanıt / The Answer is: $\dfrac{2\ln(27\cdot e^2)}{3}$

---

21. $\left.\begin{array}{l} x = t^3+3t \\ y = t^3-3t \end{array}\right\} \Rightarrow \left.\dfrac{d^2y}{dx^2}\right|_{t=1} = ?$

Yanıt / The Answer is: $\dfrac{1}{6}$

---

22. $x \neq -3, 4,$

$f(x) = x^3 - x^2 - 12x + 7$

$\Rightarrow (f^{-1})'(7) = ?$

Yanıt / The Answer is: $-\dfrac{1}{12}$

---

23. $y = \log_3(3x + 1) \Rightarrow \dfrac{dy}{dx} = ?$

Yanıt / The Answer is: $\dfrac{3}{(3x+1)\cdot\ln 3}$

---

24. $\left.\begin{array}{l} x = t - t^3 \\ y = 1 - t \end{array}\right\} \Rightarrow \left.\dfrac{dy}{dx}\right|_{t=1} = ?$

Yanıt / The Answer is: $\dfrac{1}{2}$

1. $f(x) = x^3 - 2x^2 + 3x - 5 \Rightarrow$

$$\lim_{x \to 2} \frac{f(x) - f(2)}{x - 2} = ?$$

A) 2 B) 4 C) 6
D) 7 E) 8

2. $f(x) = 4x^2 - 7x + 5 \Rightarrow$

$$\lim_{h \to 0} \frac{f(3+h) - f(3)}{h} = ?$$

A) 0 B) 5 C) 10
D) 14 E) 17

3. $f(x) = \begin{cases} ax^2 - 3 & x \leq 2 \\ 3x^2 + 6x & x > 2 \end{cases}$

$f'(1) + f'(3) = 30 \Rightarrow$ **$a = ?$**

A) –2 B) 2 C) 3
D) 6 E) 8

4. $f(x) = \sqrt{x^2 + 3} \Rightarrow$ **$f'(1) = ?$**

A) $\frac{1}{2}$ B) 1 C) $\frac{3}{2}$
D) 2 E) $\frac{5}{2}$

5. $f(x) = (x^2 - 2x) \cdot (x^3 + 3)$

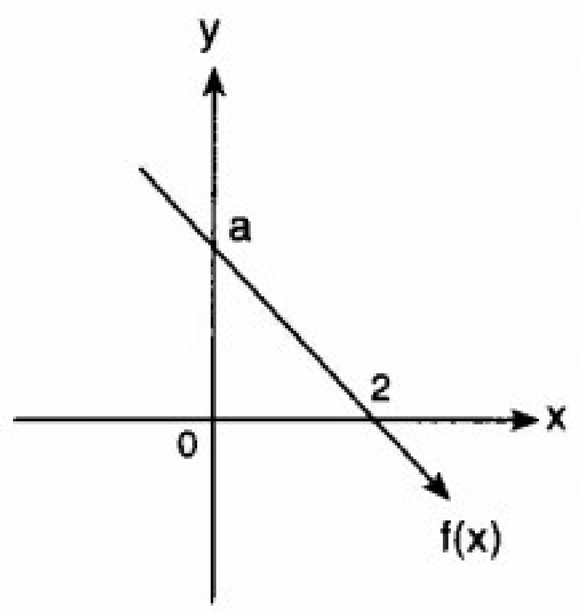
$\Rightarrow$ **$f'(-1) = ?$**

A) –3 B) 0 C) 1
D) 3 E) 5

6. $g(x) = x^2 \cdot f(x)$

$g'(4) = -48$

$\Rightarrow$ **$a = ?$**



A) 2 B) 3 C) 4
D) 5 E) 6

7. $f(x) = \dfrac{2x^2 - 5}{\sqrt[3]{(x^2-3)^2}} \Rightarrow$ **$f'(2) = ?$**

A) –2 B) –1 C) 0 D) 1 E) 2

8. $f(x) = |3x^2 + 4x - 8| + 5x \Rightarrow$ **$f'(1) = ?$**

A) –5 B) –4 C) –3 D) –2 E) –1

9. $f(3x-2) = x^2 - 4x + 7 \Rightarrow$ **$f'(13) = ?$**

A) 2 B) $\frac{5}{2}$ C) 3 D) $\frac{7}{2}$ E) 4

10. $f(2x+1) = x^2 \cdot g(x+1)$,
$g(2) = -1$,
$g'(2) = 3 \Rightarrow$ **$f'(3) = ?$**

A) 0 B) $\frac{1}{2}$ C) 1 D) $\frac{3}{2}$ E) 2

11. $f(2x-1) = (x^2+2) \cdot g(x)$,
$g(1) = -2$,
$g'(1) = 4 \Rightarrow$ **$f'(1) = ?$**

A) 1 B) 2 C) 3 D) 4 E) 5

12. $f(x) = x^{20} + x^{19} + \ldots + x^0 \Rightarrow$ **$f'(-1) = ?$**

A) –20 B) –10 C) 10 D) 20 E) 25

YANITLAR / ANSWERS							
1. D	2. E	3. C	4. A	5. C	6. B	7. C	8. A
9. A	10. B	11. D	12. B				

1. $f(x) = \sin^2(2x-3) \Rightarrow \mathbf{f'(x) = ?}$

A) $2\sin(2x-3)$

B) $2\sin(4x-6)$

C) $2\sin(3-2x)$

D) $2\sin(2x-3)\cdot\cos x$

E) $2\cos(2x-3)\cdot\sin(4x-6)$

2. $f(x) = \tan(\sin x) \Rightarrow \mathbf{f'(\pi) = ?}$

A) -1

B) 0

C) 1

D) 2

E) 3

3. $f(x) = \sin 2x\cdot\cos 3x \Rightarrow f'\left(\frac{\pi}{2}\right) = ?$

A) -2

B) -1

C) 0

D) 1

E) 2

4. $f(x) = \sin^3 3x \Rightarrow f'\left(\frac{\pi}{4}\right) = ?$

A) $\frac{-11\sqrt{2}}{4}$

B) $\frac{-9\sqrt{2}}{4}$

C) $\frac{-7\sqrt{2}}{4}$

D) $\frac{-5\sqrt{2}}{4}$

E) $\frac{-3\sqrt{2}}{4}$

5. $f(x) = 4\sin^2 3x\cdot\cos^2 3x \Rightarrow f'\left(\frac{\pi}{18}\right) = ?$

A) $-3\sqrt{3}$

B) -3

C) 0

D) 3

E) $3\sqrt{3}$

6. $f(x) = \sin^2(\cos x) \Rightarrow f'\left(\frac{3\pi}{2}\right) = ?$

A) $-\frac{\sqrt{2}}{2}$

B) $-\frac{1}{2}$

C) 0

D) $\frac{1}{2}$

E) $\frac{\sqrt{2}}{2}$

7. $f(x) = \sin 2x \cdot \cos 6x \Rightarrow \mathbf{f'\left(\frac{\pi}{6}\right) = ?}$

A) -1

B) $-\frac{1}{2}$

C) 0

D) $\frac{1}{2}$

E) 1

8. $f(x) = \frac{\sin x}{\sqrt{\cos x}} \Rightarrow \mathbf{f'(0) = ?}$

A) $-\frac{1}{2}$

B) 0

C) $\frac{1}{2}$

D) 1

E) $\frac{3}{2}$

9. $f(x) = \arccos(\cos x) \Rightarrow \mathbf{f'\left(\frac{\pi}{2}\right) = ?}$

A) -2

B) -1

C) 0

D) 1

E) 2

10. $f(x) = x \cdot \arctan x \Rightarrow \mathbf{f'(1) = ?}$

A) $\frac{\pi+1}{3}$

B) $\frac{\pi+1}{4}$

C) $\frac{\pi+2}{4}$

D) $\frac{\pi+3}{4}$

E) $\frac{\pi+5}{5}$

11. $f(x) = \operatorname{arccot}\frac{x}{2} \Rightarrow \mathbf{f'(2) = ?}$

A) $-\frac{1}{8}$

B) $-\frac{1}{6}$

C) $-\frac{1}{5}$

D) $-\frac{1}{4}$

E) $-\frac{1}{2}$

12. $f(x) = x \cdot \arcsin x + \sqrt{1-x^2} \Rightarrow \mathbf{f'\left(\frac{1}{2}\right) = ?}$

A) $\frac{\pi}{8}$ B) $\frac{\pi}{6}$ C) $\frac{\pi}{3}$

D) $\frac{\pi}{4}$ E) $\frac{\pi}{2}$

YANITLAR / ANSWERS

1. B	**2. A**	**3. C**	**4. B**	**5. E**	**6. C**	**7. A**	**8. D**
9. D	**10. C**	**11. D**	**12. B**				

1. $f(x) = \log_2(8x^2 + 4) \Rightarrow \mathbf{f'(2) = ?}$

A) $\frac{8}{9\ln 2}$ B) $\frac{10}{9\ln 2}$ C) $\frac{16}{9\ln 2}$

D) $\frac{25}{9\ln 2}$ E) $\frac{28}{9\ln 2}$

2. $x \in Z$,

$f(3x^2 - x + 1) = \log_4(5x^2 - 4) \Rightarrow \mathbf{f'(3) = ?}$

A) $\log_4 e$ B) $2\log_4 e$ C) $3\log_4 e$

D) $4\log_4 e$ E) $5\log_4 e$

3. $f(x) = \cos(\ln(2x^2 - 1)) \Rightarrow \mathbf{f'(1) = ?}$

A) 0 B) 1 C) 2

D) 3 E) 4

4. $f(x) = \ln(\ln(x^2 + 1)) \Rightarrow \mathbf{f'(1) = ?}$

A) $\log_5 e$ B) $\log_4 e$ C) $\log_3 e$

D) $\log_2 e$ E) 1

5. $\left.\begin{array}{l} x = \ln t \\ y = \cos t \end{array}\right\} \Rightarrow \left.\mathbf{\frac{dy}{dx}}\right|_{t=\frac{\pi}{2}} = \mathbf{?}$

A) $-\frac{\pi}{2}$ B) 0 C) $\frac{\pi}{4}$

D) $\frac{\pi}{3}$ E) $\frac{\pi}{2}$

6. $f(x) = \log_3(4x^3 - x^2) \Rightarrow \mathbf{f'(1) = ?}$

A) $\frac{5}{3\ln 3}$ B) $\frac{7}{3\ln 3}$ C) $\frac{8}{3\ln 3}$

D) $\frac{10}{3\ln 3}$ E) $\frac{11}{3\ln 3}$

7. $f(x) = \ln[(3x^2 - 2x + 1)^4 \cdot (2x^2 - x)] \Rightarrow f'(1) = ?$

A) 8 B) 11 C) 12

D) 15 E) 20

8. $f(x) = \log_5(x^2 - 3x)^2 \Rightarrow f'(1) = ?$

A) $\frac{1}{\ln 5}$ B) $\frac{1}{2 \cdot \ln 3}$ C) $\frac{1}{3 \cdot \ln 5}$

D) $\frac{1}{4 \cdot \ln 6}$ E) $\frac{1}{5 \cdot \ln 5}$

9.

$f(x) = x \cdot \ln x \Rightarrow \left.\frac{df(x)}{dx}\right|_{x=e} = ?$

A) $\frac{1}{2}$ B) 1 C) 2

D) $\frac{3}{2}$ E) 3

10. $y = \ln x^3 + \ln^3 x \Rightarrow \frac{dy}{dx} = ?$

A) $\frac{3(1+\ln x)}{x}$ B) $\frac{3(1+\ln^2 x)}{x}$ C) $\frac{1+\ln^2 x}{x^2}$

D) $\frac{3\ln x}{x}$ E) $\frac{3(x+\ln x)}{x}$

11.

$f(x) = x^2 \cdot \ln(x^2+1) \Rightarrow \left.\frac{df(x)}{dx}\right|_{x=1} = ?$

A) ln 2e B) $\ln\frac{2}{e}$ C) ln 4e

D) $\ln\frac{4}{e}$ E) ln 3e

12. $f(x) = \log_{2x} 4 \Rightarrow f'(2) = ?$

A) $\log_4 \sqrt{e}$ B) $\log_4 e$ C) $-\log_4 \sqrt{e}$

D) $-\log_4 \sqrt[3]{e}$ E) $-\log_4 \sqrt[3]{e^2}$

YANITLAR / ANSWERS

1. A	2. B	3. A	4. D	5. A	6. D	7. B	8. A
9. C	10. B	11. C	12. C				

1. $f(x) = e^{x^2+2x} \cdot \sin x \Rightarrow f'(0) = ?$

A) 0
B) 1
C) e^2
D) $2e^2$
E) e

2. $x \in Z$,
$f(6x^2 + x) = e^{x^3+10x} \Rightarrow f'(7) = ?$

A) e^3
B) e^5
C) e^6
D) e^9
E) e^{11}

3. $f(x) = 5^{\cos^2 x} \Rightarrow f'\left(\frac{\pi}{4}\right) = ?$

A) $-5\sqrt{5}\ln 5$
B) $-\sqrt{5}\ln 5$
C) $\ln 5$
D) $5\ln 5$
E) $25\ln 5$

4. $f(x) = 4^{(2^{x^2})} \Rightarrow f'(1) = ?$

A) $64 \cdot \ln 2 \cdot \ln 4$
B) $60 \cdot \ln 2 \cdot \ln 4$
C) $48 \cdot \ln 8$
D) $36 \cdot \ln 6$
E) $64 \cdot \ln 4$

5. $f(x) = x^2 \cdot 2^{3x^2} \Rightarrow f'(1) = ?$

A) $14 \cdot (2 + \ln 3)$
B) $16 \cdot (1 + \ln 2)$
C) $18 \cdot (1 + \ln 2)$
D) $12 \cdot (1 + \ln 4)$
E) $16 \cdot (1 + \ln 8)$

6. $y = (\sin x)^{x^2} \Rightarrow \left.\frac{dy}{dx}\right|_{x=\frac{\pi}{2}} = ?$

A) −1
B) 0
C) 1
D) 2
E) 4

7. $f(x) = e^x \cdot \ln x \Rightarrow \mathbf{f'(x) = ?}$

A) $e^x(\ln x + \frac{1}{x})$

B) $e^x\left(1+\frac{1}{x}\right)$

C) $\ln x(e^x + 1)$

D) $\frac{e^x}{x}$

E) $e^x + \ln x$

8. $f(x) = (e^x)^{e^x} \Rightarrow \mathbf{f'(\ln 2) = ?}$

A) 24

B) 12

C) 4 + ln64

D) 8 + ln 256

E) 64 ln 2

9. $f(x) = x^{\sin x} \Rightarrow f'(\frac{\pi}{2}) = ?$

A) $\frac{-\pi}{4}$

B) $\frac{-\pi}{3}$

C) $\frac{-\pi}{2}$

D) 1

E) $\frac{3\pi}{2}$

10. $y = e^x \cdot e^{\ln x} \Rightarrow \frac{dy}{dx} = ?$

A) $e^x(x+1)$

B) $\frac{e^x}{x}$

C) $\frac{e^x \ln x}{x}$

D) $e^x(x+2)$

E) $e^x\left(1+\frac{1}{x}\right)$

11. $f(x) = 2^{\ln x^3} \Rightarrow f'(1) = ?$

A) ln2

B) ln4

C) ln6

D) ln8

E) ln16

12. $f(x) = x^x + 2^x \Rightarrow \mathbf{f'(1) = ?}$

A) 1 + ln4

B) 2 + ln4

C) 3 + ln4

D) 4 + ln4

E) 5 + ln4

YANITLAR / ANSWERS

1. B 2. E 3. B 4. A 5. E 6. B 7. A 8. D
9. D 10. A 11. D 12. A

1. $f(x) = (8x-5)^7 \Rightarrow \mathbf{f^{(7)}(x) = ?}$

A) $7!\cdot 8^6$

B) $7!\cdot 8^7$

C) $7!\cdot 8^8$

D) $8!\cdot 8^7$

E) $8!\cdot 8^8$

2. $f(x) = \sin(5x+4) \Rightarrow \mathbf{f^{(21)}(x) = ?}$

A) $-5^{21}\cdot\sin(5x+4)$

B) $5^{21}\cdot\sin(5x+4)$

C) $-5^{21}\cdot\cos(5x+4)$

D) $5^{21}\cdot\cos(5x+4)$

E) $5^{20}\cdot\cos(5x+4)$

3. $f(x) = \dfrac{1}{3x+2} \Rightarrow \mathbf{f^{(18)}(-1) = ?}$

A) $17!\cdot 3^{17}$

B) $-17!\cdot 3^{17}$

C) $18!\cdot 3^{18}$

D) $-18!\cdot 3^{18}$

E) $-18!\cdot 3^{17}$

4. $f(x) = x^n \Rightarrow \mathbf{f(1) + \dfrac{f'(1)}{1!} + \dfrac{f''(1)}{2!} + \ldots + \dfrac{f^{(n)}(1)}{n!} = ?}$

A) 2^n

B) n

C) 1

D) 0

E) 2^{-n}

5. $f(x) = 4x^3 + 12x^2 + 21 \Rightarrow \mathbf{f'''(x) = ?}$

A) 8

B) 12

C) 16

D) 20

E) 24

6. $y = (3x-1)^5,\quad \dfrac{d^3y}{dx^3} = a\cdot(3x-1)^2 \Rightarrow \mathbf{a = ?}$

A) 1620

B) 1640

C) 1660

D) 1680

E) 1690

7. $f : R^+ \to R,\ f(x) = x^2 - 4x + 3 \Rightarrow (f^{-1})'(8) = ?$

A) $\frac{1}{2}$

B) $\frac{1}{3}$

C) $\frac{1}{4}$

D) $\frac{1}{5}$

E) $\frac{1}{6}$

8. $f : R^- \to R,\ f(x) = x^2 - 5x - 4 \Rightarrow (f^{-1})'(2) = ?$

A) $-\frac{1}{8}$

B) $-\frac{1}{7}$

C) $-\frac{1}{6}$

D) $-\frac{1}{5}$

E) $-\frac{1}{4}$

9. $f(x) = x^5 - 2x^4 + x^3 - 2x^2 + 4x - 4$

$\Rightarrow (f^{-1})'(4) = ?$

A) $\frac{1}{6}$

B) $\frac{1}{8}$

C) $\frac{1}{12}$

D) $\frac{1}{16}$

E) $\frac{1}{24}$

10. $f(x) = \frac{(x-2)^3}{2} \Rightarrow f^{-1}(4) + (f^{-1})'(4) = ?$

A) $\frac{16}{17}$

B) $\frac{1}{25}$

C) $\frac{5}{3}$

D) $\frac{25}{6}$

E) 25

11. $f : [1, \infty] \to R,$

$f(x) = x^2 - 3x + 5 \Rightarrow (f^{-1})'(9) = ?$

A) $\frac{1}{3}$

B) $\frac{1}{5}$

C) $\frac{1}{7}$

D) $\frac{1}{9}$

E) $\frac{1}{11}$

12. $f(x) = x^3 + 5x \Rightarrow (f^{-1})'(6) = ?$

A) $\frac{1}{8}$ B) $\frac{1}{9}$ C) $\frac{2}{15}$

D) $\frac{3}{13}$ E) $\frac{3}{14}$

YANITLAR / ANSWERS

1. B	2. D	3. D	4. A	5. E	6. A	7. E	8. B
9. E	10. D	11. B	12. A				

1. $\left.\begin{array}{l} y = t^2 - 2 \\ t = u^3 - 3u^2 \\ u = 2x + 1 \end{array}\right\} \Rightarrow \left.\dfrac{dy}{dx}\right|_{x=0} = ?$

A) 20 B) 22 C) 24

D) 27 E) 30

2. $\left.\begin{array}{l} y = 3u^2 - 5 \\ u = 2t + 1 \\ t = x^3 \end{array}\right\} \Rightarrow \left.\dfrac{dy}{dx}\right|_{x=1} = ?$

A) 108 B) 110 C) 114

D) 120 E) 124

3. $\left.\begin{array}{l} x = e^{2t^2} \\ y = 3t^2 - 5t \end{array}\right\} \Rightarrow \left.\dfrac{dy}{dx}\right|_{t=1} = ?$

A) 1 B) $\dfrac{1}{e^2}$ C) $\dfrac{1}{2e^2}$

D) $\dfrac{1}{3e^2}$ E) $\dfrac{1}{4e^2}$

4. $\left.\begin{array}{l} x = 4t^2 - 3t \\ y = t^2 + 5t \end{array}\right\} \Rightarrow \left.\dfrac{d^2y}{dx^2}\right|_{t=0} = ?$

A) $\dfrac{34}{27}$ B) $\dfrac{40}{27}$ C) $\dfrac{44}{27}$

D) $\dfrac{46}{27}$ E) $\dfrac{49}{27}$

5. $\left.\begin{array}{l} x = \cos t \\ y = (\sin t)^2 \end{array}\right\} \Rightarrow \left.\dfrac{d^2y}{dx^2}\right|_{t=\pi/4} = ?$

A) –2 B) –3 C) –4

D) –5 E) –6

6. $\left.\begin{array}{l} x = e^{t^2+3} \\ y = e^{3t^2-2} \end{array}\right\} \Rightarrow \left.\dfrac{dy}{dx}\right|_{t=1} = ?$

A) $3e^{-3}$ B) $3e^{-5}$ C) $4e^{-7}$

D) $8e^{-12}$ E) $9e^{-16}$

7. $F(x, y) = x^2 - 5xy + 6x = 0 \Rightarrow \left.\frac{dy}{dx}\right|_{(-1,\ 1)} = ?$

A) 1
B) $\frac{4}{5}$
C) $\frac{3}{5}$
D) $\frac{2}{5}$
E) $\frac{1}{5}$

8. $x^2y = \ln x + 2 \Rightarrow \left.\frac{dy}{dx}\right|_{(1,\ 2)} = ?$

A) –6
B) –5
C) –4
D) –3
E) –2

9. $F(x, y) = x^2 - \ln(x^2 \cdot y) + 3xy - 4 = 0$

$\Rightarrow \left.\frac{dy}{dx}\right|_{(1,\ 1)} = ?$

A) $-\frac{3}{2}$
B) $-\frac{5}{2}$
C) $-\frac{7}{2}$
D) $-\frac{9}{2}$
E) $-\frac{11}{2}$

10. $e^{x+y} = y^x \Rightarrow \frac{dy}{dx} = ?$

A) $\frac{y}{x \cdot (x+y)}$
B) $\frac{y^2}{x \cdot (y-x)}$
C) $\frac{y^3}{x \cdot (y-x)}$
D) $\frac{y^3}{x^2 - xy}$
E) $\frac{y^2}{x^2 + y}$

11. $x^3 + y^3 = 1 \Rightarrow \frac{d^2y}{dx^2} = ?$

A) $-\frac{x}{y^3}$
B) $-\frac{2x}{y^5}$
C) $\frac{x}{y^4}$
D) $\frac{4x}{y^5}$
E) $-\frac{4x}{y^5}$

12. $F(x, y) = 4x^3y - x^2y^2 + 3xy^2 - 2xy = 0$

$\Rightarrow \left.\frac{dy}{dx}\right|_{(1,\ -1)} = ?$

A) $-\frac{11}{2}$
B) $-\frac{9}{2}$
C) $-\frac{7}{2}$
D) $-\frac{5}{2}$
E) $-\frac{3}{2}$

YANITLAR / ANSWERS							
1. C	2. A	3. E	4. D	5. A	6. A	7. E	8. D
9. A	10. B	11. B	12. B				

1. $\lim\limits_{x \to \frac{\pi}{2}} \dfrac{1-\sin x}{\cos x} = ?$

A) 0
B) 1
C) 2
D) 3
E) 4

2. $\lim\limits_{x \to \pi} \dfrac{\cos\frac{x}{2}}{x-\pi} = ?$

A) $-\frac{1}{8}$
B) $-\frac{1}{6}$
C) $-\frac{1}{5}$
D) $-\frac{1}{4}$
E) $-\frac{1}{2}$

3. $\lim\limits_{x \to 0} \dfrac{4\sin 9x}{3x} = ?$

A) 6
B) 9
C) 12
D) 15
E) 18

4. $\lim\limits_{x \to 0} \dfrac{\sin x - x}{x^3} = ?$

A) $-\frac{1}{12}$
B) $-\frac{1}{6}$
C) $-\frac{1}{3}$
D) $-\frac{1}{2}$
E) $\frac{1}{3}$

5. $\lim\limits_{x \to 2} \dfrac{\ln x - \ln 2}{x^2 - 4} = ?$

A) $-\frac{1}{8}$
B) $-\frac{1}{6}$
C) 1
D) $\frac{1}{6}$
E) $\frac{1}{8}$

6. $\lim\limits_{x \to 0^+} \dfrac{\ln \sin x}{\ln \tan x} = ?$

A) -1
B) $-\infty$
C) 0
D) $+\infty$
E) 1

7. $a > 2 \Rightarrow \lim\limits_{x \to 0} \dfrac{e^{ax} - e^{x} - x}{x^2} = ?$

A) $+\infty$

B) 1

C) 0

D) -1

E) $-\infty$

8. $\lim\limits_{x \to \infty} \dfrac{x + \ln x}{x \cdot \ln x} = ?$

A) -4

B) -2

C) 0

D) 2

E) 4

9. $f'(a) = ?$

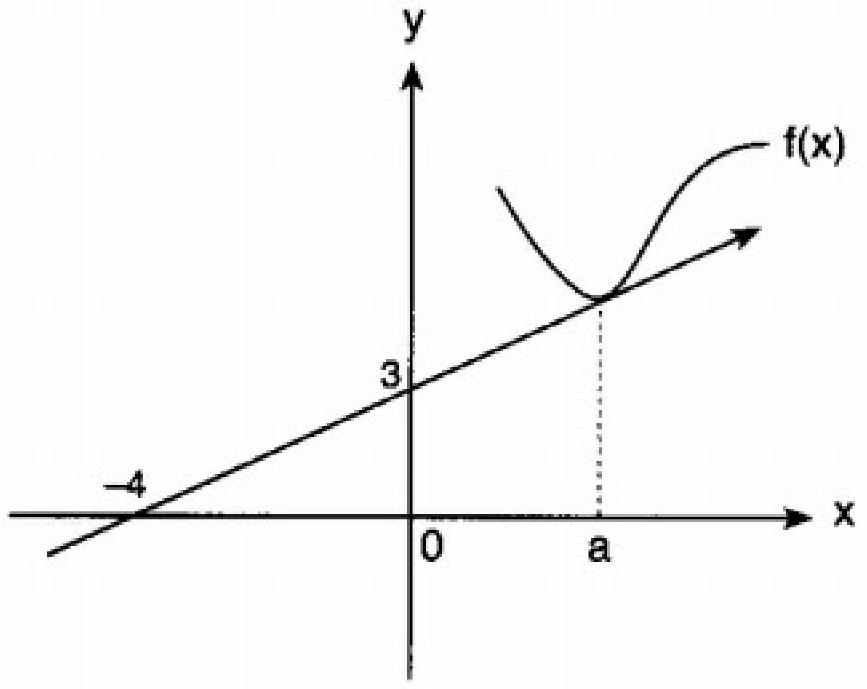
A) $\dfrac{4}{3}$

B) $\dfrac{3}{4}$

C) $\dfrac{3}{5}$

D) $-\dfrac{3}{4}$

E) $-\dfrac{4}{3}$



10. $h(x) = x^2 \cdot f(2x + 1)$

$\Rightarrow h'(-3) = ?$

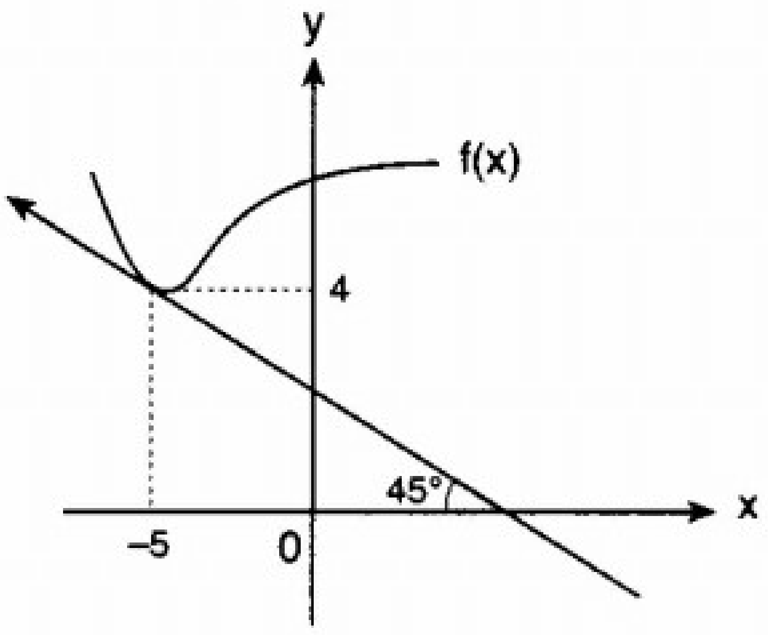
A) -6

B) -12

C) -18

D) -24

E) -42



11. $d : y = 3x + 1,$

$h(x) = \dfrac{f(x)}{x} \Rightarrow h'(2) = ?$

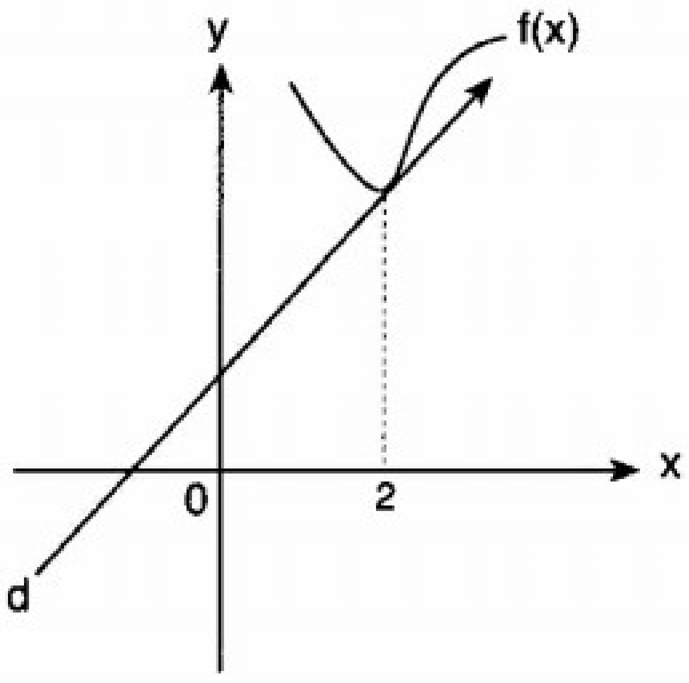
A) $-\dfrac{1}{4}$

B) $-\dfrac{1}{2}$

C) $-\dfrac{3}{4}$

D) $-\dfrac{4}{3}$

E) -2



12. $b = ?$

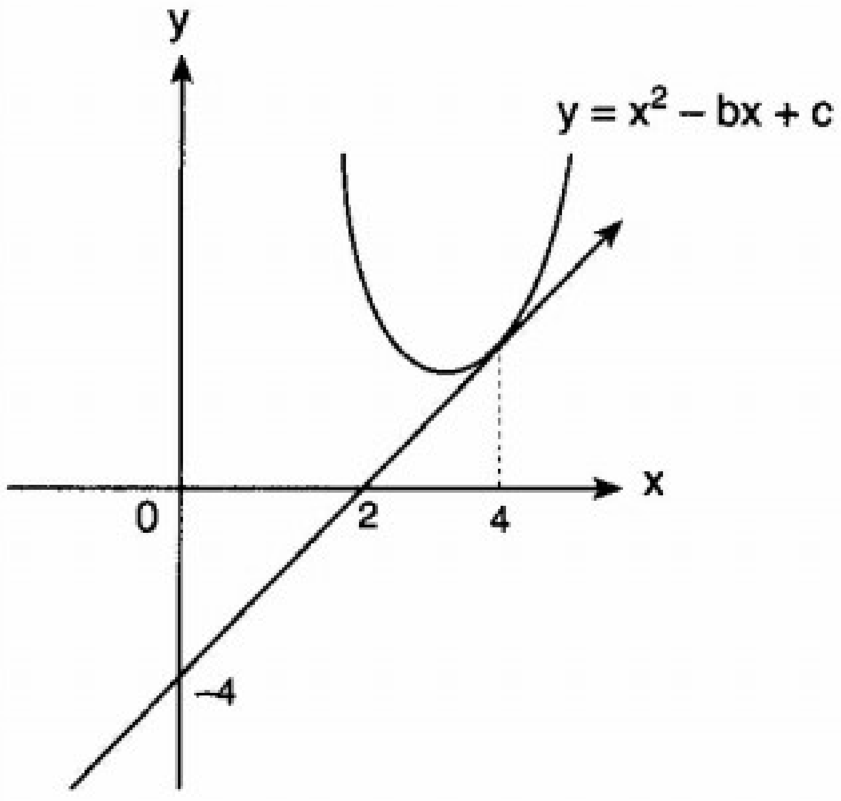
A) 2

B) 4

C) 6

D) 8

E) 10



YANITLAR / ANSWERS

1. A	**2. E**	**3. C**	**4. B**	**5. E**	**6. D**	**7. A**	**8. C**
9. B	**10. E**	**11. A**	**12. C**				

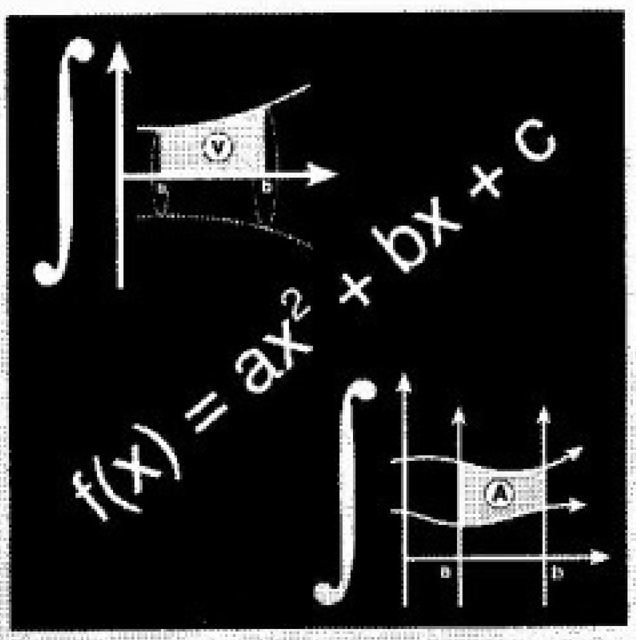
ÜNİTE 10
UNIT

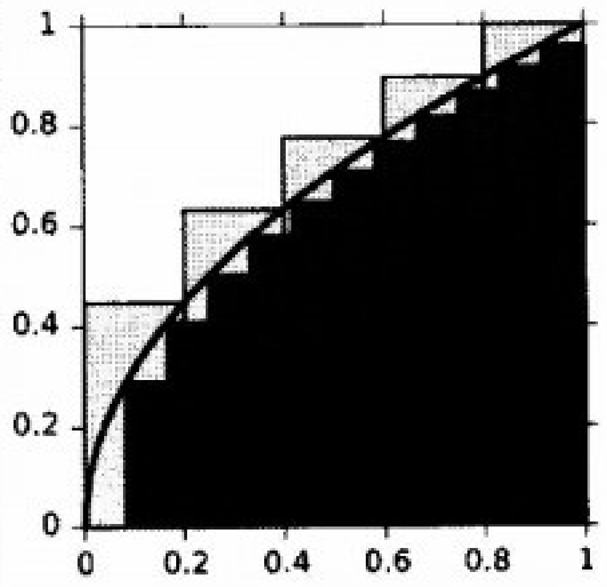
Bu ünitede, belirsiz integral, belirli integral ve integral uygulamaları ayrıntılı anlatılmıştır. Ilk olarak, belirsiz integral ve integral alma yöntemleri , daha sonra belirli integral konusu anlatılmıştır. Son olarak, integral uygulamaları anlatılmıştır.

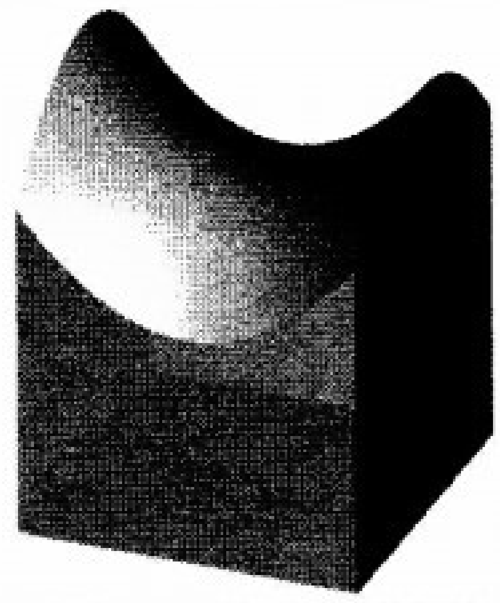
Bu ünite; 127 çözümlü örnek, 60 alıştırma ve 84 test sorusundan oluşmaktadır.

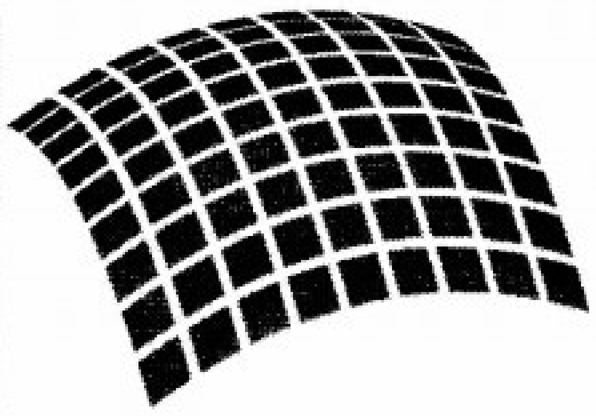
In this unit, indefinite integral, definite integral and applications of the integral are explained in detailed. Firstly, indefinite integral and integral methods are explained. Later, definite integral is explained. Subsequently, applications of integral are explained.

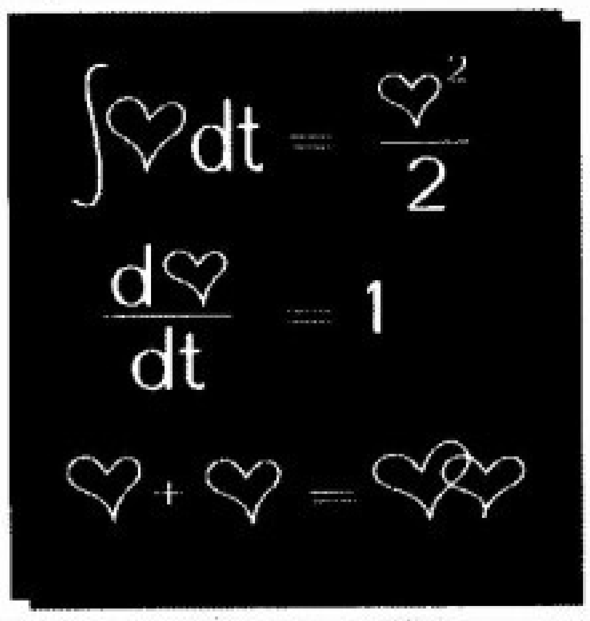
This unit includes; 84 test questions.











- **BELİRSİZ İNTEGRAL / *INDEFINITE INTEGRAL*** .... 741 – 784
- **BELİRLİ İNTEGRAL / *DEFINITE INTEGRAL*** .... 785 – 826

1. $f'(x) = 12x^3 - 6x + 1,\ f(-1) = 5,\ \mathbf{f(1) = ?}$

A) 5
B) 6
C) 7
D) 8
E) 9

2. $\int (3x-2)\, f(x)\, dx = 2x^3 + \frac{5}{2}x^2 - 6x + C$

$\Rightarrow \mathbf{f(-1) = ?}$

A) − 2
B) −1
C) 0
D) 1
E) 2

3. $\int \frac{e^x - e^{-x}}{2}\, dx = ?$

A) $\frac{1}{2}(e^x + e^{-x}) + C$
B) $(e^x + e^{-x}) + C$
C) $\frac{1}{5}(e^x + e^{-x}) + C$
D) $(e^x - e^{-x}) + C$
E) $(e^{2x} - e^{-2x}) + C$

4. $\int \frac{dx}{\sqrt{x\sqrt{x}}} = ?$

A) $\frac{1}{4}\sqrt[4]{x} + C$
B) $\frac{1}{2}\sqrt[4]{x} + C$
C) $\sqrt[4]{x} + C$
D) $2\sqrt[4]{x} + C$
E) $4\sqrt[4]{x} + C$

5. $\int (x^2y + e^xy + e^y)\, dy = ?$

A) $\frac{x^{3y}}{3} + e^xy + xe^y + C$
B) $\frac{x^2y^2}{2} + e^xy + e^y + C$
C) $\frac{y^2(x^2 + e^x)}{2} + e^y + C$
D) $x^2y + \frac{e^xy^2}{2} + C$
E) $\frac{x^2 + y^2}{2} + \frac{e^xy^2}{2} + xe^y + C$

6. $\int \frac{1 - \sqrt{x}}{2\sqrt{x}}\, dx = ?$

A) $\frac{(1 - \sqrt{x})^2}{2} + C$
B) $\sqrt{x} - \frac{1}{2}x + C$
C) $(\sqrt{x} + 1)^2 + C$
D) $\frac{x + \sqrt{x}}{2} + C$
E) $\frac{1 + \sqrt{2x}}{2} + C$

7. $\int \tan^2 x \, dx = ?$

A) $\sin x - x + C$

B) $\cos x + x + C$

C) $\tan x - x + C$

D) $\cot x + x + C$

E) $\sec x - x + C$

8. $\int \frac{d(x^3)}{x^2} = ?$

A) $\frac{x}{3} + C$

B) $\frac{x^2}{3} + C$

C) $x^3 + C$

D) $3x^2 + C$

E) $3x + C$

9. $\int (x-1)^2 \cdot x^2 \, dx = ?$

A) $\frac{x^5}{10} - \frac{x^4}{4} + \frac{x^3}{2} + C$

B) $\frac{x^5}{5} + \frac{x^4}{4} - \frac{x^3}{3} + C$

C) $\frac{x^4}{4} - \frac{x^3}{2} + \frac{x^2}{4} + C$

D) $\frac{x^5}{5} - \frac{x^4}{2} + \frac{x^3}{3} + C$

E) $\frac{x^5}{5} - \frac{x^4}{4} + \frac{x^3}{6} + C$

10. $f''(x) = 20x^3 - 36x^2 + 12x - 4,$

$f'(0) = -1,$

$f(0) = 2 \Rightarrow f(1) = ?$

A) 0

B) –1

C) –2

D) –3

E) –4

11. $\int \left(\frac{1}{x^2} - \frac{2}{x^3} \right) dx = ?$

A) $-\frac{1}{x^3} - \frac{2}{x^4} + C$

B) $\frac{3}{x^3} - \frac{8}{x^4} + C$

C) $\frac{1}{3x^3} - \frac{1}{2x^4} + C$

D) $-\frac{2}{x^3} - \frac{6}{x^4} + C$

E) $-\frac{1}{x} + \frac{1}{x^2} + C$

12. $\int \left(\sin x + \frac{4}{\sqrt{1-x^2}} \right) dx = ?$

A) $-\cos x + 4\arcsin x + C$

B) $\cos x + 4\arcsin x + C$

C) $\sin x + 4\arccos x + C$

D) $-\sin x + 4\arccos x + C$

E) $4\arccos x + C$

YANITLAR / ANSWERS

1. C	2. D	3. A	4. E	5. C	6. B	7. C	8. E
9. D	10. B	11. E	12. A				

1. $f'(x) = 12x^3 - 6x + 1$

$$\int f'(x)\,dx = \int (12x^3 - 6x + 1)\,dx$$

$$f(x) = 3x^4 - 3x^2 + x + C$$

$$f(-1) = 3\cdot(-1)^4 - 3\cdot(-1)^2 + (-1) + C$$

$$5 = -1 + C \Rightarrow C = 6$$

$$f(1) = 3\cdot 1^4 - 3\cdot 1^2 + 1 + 6 = 7$$

Yanıt / The Answer is C

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2. $\left(\int (3x-2)\cdot f(x)\,dx\right)' = \left(2x^3 + \frac{5}{2}x^2 - 6x + C\right)'$

$$(3x-2)\cdot f(x) = 6x^2 + 5x - 6$$

$$(3x-2)\cdot f(x) = (3x-2)\cdot(2x+3)$$

$$f(x) = 2x + 3$$

$$f(-1) = 2\cdot(-1) + 3 = 1$$

Yanıt / The Answer is D

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3. $\int \frac{e^x - e^{-x}}{2}\,dx = \frac{1}{2}\int (e^x - e^{-x})\,dx$

$$= \frac{1}{2}\left(\int e^x dx - \int e^{-x} dx\right)$$

$$= \frac{1}{2}(e^x + e^{-x}) + C$$

Yanıt / The Answer is A

---

4. $\int \frac{dx}{\sqrt{x\sqrt{x}}} = \int \frac{dx}{\sqrt[4]{x^3}}$

$$= \int x^{-\frac{3}{4}}\,dx$$

$$= 4\cdot x^{\frac{1}{4}} + C$$

$$= 4\sqrt[4]{x} + C$$

Yanıt / The Answer is E

---

5. $\int \left(x^2y + e^xy + e^y\right)dy = \int x^2y\,dy + \int e^xy\,dy + \int e^y\,dy$

$$= \frac{x^2y^2}{2} + \frac{e^xy^2}{2} + e^y + C$$

$$= \frac{y^2(e^y + e^x)}{2} + e^y + C$$

Yanıt / The Answer is C

---

6. $\int \frac{1-\sqrt{x}}{2\sqrt{x}}\,dx = \int \frac{1}{2\sqrt{x}}\,dx - \int \frac{\sqrt{x}}{2\sqrt{x}}\,dx$

$$= \frac{1}{2}\int x^{-\frac{1}{2}}\,dx - \int \frac{1}{2}\,dx$$

$$= \frac{1}{2}\cdot 2x^{\frac{1}{2}} - \frac{1}{2}x + C$$

$$= \sqrt{x} - \frac{x}{2} + C$$

Yanıt / The Answer is B

7. $$\int \tan^2 x\,dx = \int (1+\tan^2 x-1)\,dx$$
$$= \int (1+\tan^2 x)\,dx - \int dx$$
$$= \tan x - x + C$$

Yanıt / The Answer is C

8. $$\int \frac{d(x^3)}{x^2} = \int \frac{3x^2}{x^2}\,dx$$
$$= \int 3\,dx$$
$$= 3x + C$$

Yanıt / The Answer is E

9. $$\int (x-1)^2\cdot x^2\,dx = \int (x^2-2x+1)\cdot x^2\,dx$$
$$= \int (x^4-2x^3+x^2)\,dx$$
$$= \frac{x^5}{5}-\frac{2x^4}{4}+\frac{x^3}{3}+C$$
$$= \frac{x^5}{5}-\frac{x^4}{2}+\frac{x^3}{3}+C$$

Yanıt / The Answer is D

10. $$\int f''(x)\,dx = \int (20x^3-36x^2+12x-4)\,dx$$
$$f'(x) = 5x^4-12x^3+6x^2-4x+C$$
$$f'(0) = 5\cdot 0^4-12\cdot 0^3+6\cdot 0^2-4\cdot 0+C \Rightarrow C=-1$$
$$\int f'(x) = \int (5x^4-12x^3+6x^2-4x-1)\,dx$$
$$f(x) = x^5-3x^4+2x^3-2x^2-x+C$$
$$f(0) = 0^5-3\cdot 0^4+2\cdot 0^3-2\cdot 0^2-0+C=2$$
$$\Rightarrow C=2$$
$$f(1) = 1^5-3\cdot 1^4+2\cdot 1^3-2\cdot 1^2-1+2=-1$$

Yanıt / The Answer is B

11. $$\int \left(\frac{1}{x^2}-\frac{2}{x^3}\right)dx = \int x^{-2}\,dx - 2\int x^{-3}\,dx$$
$$= -\frac{1}{x}+\frac{1}{x^2}+C$$

Yanıt / The Answer is E

12. $$\int \left(\sin x+\frac{4}{\sqrt{1-x^2}}\right)dx = \int \sin x\,dx + 4\int \frac{dx}{\sqrt{1-x^2}}$$
$$= -\cos x + 4\arcsin x + C$$

Yanıt / The Answer is A

1. $\int \frac{dx}{x-3} = ?$

A) $\frac{1}{3} \cdot \ln|x-3| + C$

B) $\frac{1}{3} \cdot \ln|x+3| + C$

C) $3 \cdot \ln|x+3| + C$

D) $\ln|x+3| + C$

E) $\ln|x-3| + C$

2. $\int \frac{x\,dx}{(x^2+4)^3} = ?$

A) $-\frac{1}{(x^2+4)^2} + C$

B) $\ln(x^2+4) + C$

C) $\arctan(2x) + C$

D) $-\frac{1}{4(x^2+4)^2} + C$

E) $(x^2+4)^{-3} + C$

3. $\int \frac{e^x}{\sqrt{1-e^{2x}}}\,dx = ?$

A) $\frac{1}{2}\arcsin e^x + C$

B) $\arcsin e^x + C$

C) $-\arcsin e^x + C$

D) $-\frac{1}{2}\arcsin e^x + C$

E) $\ln\left|\sqrt{1-e^{2x}}\right| + C$

4. $\int \frac{dx}{\sqrt{1-9x^2}} = ?$

A) $\arcsin x + C$

B) $\frac{1}{3}\arcsin x + C$

C) $\frac{1}{3}\arcsin 3x + C$

D) $\arcsin 3x + C$

E) $\frac{1}{9}\arcsin x + C$

5. $\int \frac{\sin\sqrt{x}}{2\sqrt{x}}\,dx = ?$

A) $\cos\sqrt{x} + C$

B) $-\cos\sqrt{x} + C$

C) $\frac{1}{2}\cos\sqrt{x} + C$

D) $-\frac{1}{2}\cos\sqrt{x} + C$

E) $-\frac{1}{2}\cos x + C$

6. $f(x) = \int \frac{1}{x\ln x}\,dx$ ve (and) $f(e) = 6 \Rightarrow$ **$f(x) = ?$**

A) $\ln x + 6$

B) $\ln^2 x + 6$

C) $2\ln x + 3$

D) $\ln|\ln x| + 6$

E) $x^2 \ln x + 9$

7. $\int \frac{dx}{x \cdot \cos^2(\ln x)} = ?$

A) $\frac{1}{2}\ln|\sin x| + C$

B) $\frac{1}{2}\tan(\ln x) + C$

C) $\tan(\ln x) + C$

D) $\frac{1}{\sin(\ln x)} + C$

E) $\cos^3(\ln x) + C$

8. $\int \frac{e^{\sqrt{x}}}{\sqrt{x}}\,dx = ?$

A) $e^{\sqrt{x}} + C$

B) $\frac{1}{2}e^{\sqrt{x}} + C$

C) $2e^{\sqrt{x}} + C$

D) $e^{\sqrt{x}} \cdot x + C$

E) $e^{\sqrt{x}} + \sqrt{x} + C$

9. $\int \frac{\sin 2x}{8 - \cos^2 x}\,dx = ?$

A) $\ln|\cos^2 x| + C$

B) $\ln|8 - \cos^2 x| + C$

C) $\frac{(8 - \cos^2 x)^2}{2} + C$

D) $\frac{1}{2(8 - \cos^2 x)} + C$

E) $8x - \sin^2 x + C$

10. $\int \frac{x^4 - 2}{(x^5 - 10x)^5}\,dx = ?$

A) $\frac{\ln|x^5 - 10x|}{5} + C$

B) $\frac{\ln|x^5 - 10x|}{25} + C$

C) $\frac{-1}{20(x^5 - 10x)^4} + C$

D) $\frac{-1}{25(x^5 - 10x)^5} + C$

E) $\frac{-1}{30(x^5 - 10x)^6} + C$

11. $\int \frac{e^{2x}}{\cos^2(e^{2x})}\,dx = ?$

A) $\ln|\cos^2 e^{2x}| + C$

B) $2\ln|\cos e^{2x}| + C$

C) $\frac{\tan(e^{2x})}{2} + C$

D) $\frac{\tan^2(e^{2x})}{2} + C$

E) $\frac{-1}{2\cos(e^{2x})} + C$

12. $\int \frac{dx}{1 + \cos x} = ?$

A) $-\cot x - \frac{1}{\sin x} + C$

B) $-\cot x + \frac{1}{\sin x} + C$

C) $\cot x - \frac{1}{\sin x} + C$

D) $\cot x + \frac{1}{\cos x} + C$

E) $\cot x - \frac{1}{\cos x} + C$

YANITLAR / ANSWERS

1. E	2. D	3. B	4. C	5. B	6. D	7. C	8. C
9. B	10. C	11. C	12. B				

1. $\left.\begin{array}{l} x-3=u \\ dx=du \end{array}\right\} \Rightarrow \int \frac{dx}{x-3} = \int \frac{du}{u}$

$= \ln|u|+C$

$= \ln|x-3|+C$

Yanıt / The Answer is E

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2. $x^2+4=u \Rightarrow 2xdx=du$

$xdx=\frac{du}{2}$

$\int \frac{x\cdot dx}{(x^2+4)^3} = \int \frac{1}{u^3}\cdot\frac{du}{2}$

$= \frac{1}{2}\cdot\int u^{-3}du$

$= \frac{1}{2}\cdot\frac{u^{-2}}{-2}+C$

$= -\frac{1}{4\cdot(x^2+4)^2}+C$

Yanıt / The Answer is D

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3. $e^x=u \Rightarrow e^x dx=du$

$\int \frac{e^x}{\sqrt{1-e^{2x}}}dx = \int \frac{du}{\sqrt{1-u^2}}$

$= \arcsin u+C$

$= \arcsin e^x+C$

Yanıt / The Answer is B

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4. $3x=u \Rightarrow 3dx=du$

$dx=\frac{du}{3}$

$\int \frac{dx}{\sqrt{1-9x^2}} = \frac{1}{3}\int \frac{du}{\sqrt{1-u^2}}$

$= \frac{1}{3}\arcsin u+C$

$= \frac{1}{3}\arcsin 3x+C$

Yanıt / The Answer is C

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5. $\sqrt{x}=u \Rightarrow \frac{1}{2\sqrt{x}}dx=du$

$\int \frac{\sin\sqrt{x}}{2\sqrt{x}}dx = \int \sin u\, du$

$= -\cos u+C$

$= -\cos\sqrt{x}+C$

Yanıt / The Answer is B

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6. $\left.\begin{array}{l} \ln x=u \\ \frac{1}{x}dx=du \end{array}\right\} \Rightarrow \int \frac{1}{x\cdot\ln x}dx = \int \frac{du}{u} = \ln|u|+C = \ln|\ln x|+C$

$f(x)=\ln|\ln x|+C$

$f(e)=\ln|\ln e|+C=6$

$\Rightarrow C=6$

$\Rightarrow f(x)=\ln|\ln x|+6$

Yanıt / The Answer is D

7. $\ln x = u \Rightarrow \frac{1}{x}dx = du$

$$\int \frac{dx}{x\cdot\cos^2(\ln x)} = \int \frac{du}{\cos^2 u}$$

$$= \tan u + C$$

$$= \tan(\ln x) + C$$

Yanıt / The Answer is C

8. $\left.\begin{array}{l} \sqrt{x} = u \\ \frac{1}{2\sqrt{x}}dx = du \\ \frac{1}{\sqrt{x}}dx = 2\cdot du \end{array}\right\} \Rightarrow \int \frac{e^{\sqrt{x}}}{\sqrt{x}}dx = \int e^u\, 2du$

$$= 2e^u + C$$

$$= 2e^{\sqrt{x}} + C$$

Yanıt / The Answer is C

9. $u = 8 - \cos^2 x \Rightarrow \sin 2x\, dx = du$

$$\int \frac{\sin 2x}{8-\cos^2 x}dx = \int \frac{du}{u}$$

$$= \ln u + C$$

$$= \ln|8-\cos^2 x| + C$$

Yanıt / The Answer is B

10. $\left.\begin{array}{l} u = x^5 - 10x \\ du = (5x^4 - 10)dx \\ \frac{1}{5}du = (x^4-2)dx \end{array}\right\} \Rightarrow \int \frac{x^4-2}{(x^5-10x)^5}dx = \int \frac{\frac{1}{5}du}{u^5}$

$$= \frac{1}{5}\int \frac{du}{u^5}$$

$$= \frac{1}{5}\cdot\frac{u^{-4}}{-4} + C$$

$$= -\frac{1}{20\cdot u^4} + C$$

$$= -\frac{1}{20\cdot(x^5 - 10^4)^4} + C$$

Yanıt / The Answer is C

11. $\left.\begin{array}{l} u = e^{2x} \\ du = 2e^{2x}dx \\ e^{2x}dx = \frac{du}{2} \end{array}\right\} \Rightarrow \int \frac{e^{2x}}{\cos^2(e^{2x})}dx = \int \frac{\frac{1}{2}du}{\cos^2 u}$

$$= \frac{1}{2}\int \frac{du}{\cos^2 u}$$

$$= \frac{1}{2}\cdot\tan u + C$$

$$= \frac{1}{2}\cdot\tan(e^{2x}) + C$$

Yanıt / The Answer is C

12. $\int \frac{dx}{1+\cos x} = \int \frac{1-\cos x}{1-\cos^2 x}dx$

$$= \int \frac{1-\cos x}{\sin^2 x}dx = \int \frac{1}{\sin^2 x}dx - \int \frac{\cos x\, dx}{\sin^2 x}$$

$\left.\begin{array}{l} u = \sin x \\ du = \cos x\, dx \end{array}\right\} \Rightarrow -\cot x - \int \frac{du}{u^2}$

$$= -\cot x - \frac{u^{-1}}{-1} + C$$

$$= -\cot x + \frac{1}{\sin x} + C$$

Yanıt / The Answer is B

1. $\int \frac{2x^3-6x-4}{x^2-4}\,dx = ?$

A) $x^2+\ln(x+2)^2+C$

B) $\frac{x^2}{2}+\ln(x+2)^2+C$

C) $\frac{x^2}{2}+\ln|x+2|+C$

D) $2x^2+\frac{1}{2}\ln|x+2|^2+C$

E) $x^2+\frac{1}{2}\ln|x+2|+C$

2. $\int \frac{3x+1}{x^2-1}\,dx = ?$

A) $\ln\left((x-1)^2\cdot(x+1)\right)+C$

B) $\ln\left((x-1)^2\cdot(x-2)\right)+C$

C) $\frac{3}{2}\ln(x^2-1)+C$

D) $\frac{2}{3}\ln(x^2-1)+C$

E) $6\ln(x^2-1)+C$

3. $\int \frac{dx}{x^2-10x+29} = ?$

A) $\frac{1}{5}\cdot\arctan\left(\frac{x-5}{5}\right)+C$

B) $\frac{1}{4}\cdot\arctan\left(\frac{x-4}{4}\right)+C$

C) $\frac{1}{3}\cdot\arctan\left(\frac{x-8}{3}\right)+C$

D) $\frac{1}{2}\cdot\arctan\left(\frac{x-5}{2}\right)+C$

E) $\frac{1}{3}\cdot\arctan\left(\frac{x-2}{3}\right)+C$

4. $\int \frac{dx}{x^2-4} = ?$

A) $\frac{1}{4}\ln\left|\frac{x-2}{x+2}\right|+C$

B) $-\frac{1}{4}\ln\left|\frac{x-2}{x+2}\right|+C$

C) $-\frac{1}{2}\ln\left|\frac{x+2}{x-2}\right|+C$

D) $\frac{1}{2}\ln\left|\frac{x+2}{x-2}\right|+C$

E) $2\ln\left|\frac{x+2}{x-2}\right|+C$

5. $\int \frac{x+2}{x^2+x}\,dx = ?$

A) $\ln\left|\frac{x+1}{x^2}\right|+C$

B) $\ln\left|\frac{2x^2}{x-1}\right|+C$

C) $\ln\left|\frac{2x^2}{x+1}\right|+C$

D) $\ln\left|\frac{x^2}{x-1}\right|+C$

E) $\ln\left|\frac{x^2}{x+1}\right|+C$

6. $\int x\cdot\ln x\,dx = ?$

A) $x\cdot\ln x-\frac{x^2}{2}+C$

B) $x^2\cdot\ln x-\frac{x^3}{3}+C$

C) $\frac{x^2}{2}\cdot\ln x-\frac{x^2}{4}+C$

D) $x\cdot\ln x-\frac{x^2}{2}+C$

E) $\ln^2x-\frac{x^2}{2}+C$

7. $\int (x^2 - x + 1)e^x\,dx = ?$

A) $e^x \cdot (x^2 - 3x + 4) + C$

B) $e^x \cdot (x^2 + x - 5) + C$

C) $e^x \cdot (x^2 - 2x - 3) + C$

D) $e^x \cdot (x^2 + x + 6) + C$

E) $e^x \cdot (x^2 + 5x - 1) + C$

8. $\int x^2 \sin x\,dx = ?$

A) $\sin x(2 - x^2) + 2x \cdot \cos x + C$

B) $\cos x(2 - x^2) + 2x \cdot \sin x + C$

C) $\cos x(2 - x^2) + x \cdot \sin x + C$

D) $\sin x(2 - x^2) + x \cdot \cos x + C$

E) $\tan x(2 - x^2) + x \cdot \sin x + C$

9. $\int \sin^3 x\,dx = ?$

A) $-\cos x + \dfrac{\cos^2 x}{3} + C$

B) $\cos x + \dfrac{\cos^2 x}{3} + C$

C) $-\cos x + \dfrac{\cos^3 x}{3} + C$

D) $-\cos x - \dfrac{\cos^3 x}{3} + C$

E) $-\cos x - \dfrac{\cos^2 x}{3} + C$

10. $\int \cos x \cdot \cos 3x\,dx = ?$

A) $\dfrac{\sin 2x}{4} + \dfrac{\sin 4x}{8} + C$

B) $\dfrac{\sin 3x}{6} + \dfrac{\sin 4x}{8} + C$

C) $\dfrac{\sin 2x}{2} + \dfrac{\sin 4x}{4} + C$

D) $\dfrac{\sin^2 6x}{6} + \cos x + C$

E) $\dfrac{\cos^2 3x}{3} - \dfrac{\sin 2x}{2} + C$

11. $\int \cos(\cos^2 x) \cdot \sin 2x\,dx = ?$

A) $-\sin(\cos^2 x) + C$

B) $-\cos(\cos^2 x) + C$

C) $\sin(\cos^2 x) + C$

D) $-2\sin(\cos x) + C$

E) $-\sin(\cos x) + C$

12. $\int e^x \sin x\,dx = ?$

A) $e^x(\sin x - \cos x) + C$

B) $e^x(\sin x + \cos x) + C$

C) $e^x\left(\dfrac{\sin x + \cos x}{2}\right) + C$

D) $e^x\left(\dfrac{\sin x - \cos x}{2}\right) + C$

E) $e^x \cdot 2(\sin x - \cos x) + C$

YANITLAR / ANSWERS

1. A	2. A	3. D	4. A	5. E	6. C	7. A	8. B
9. D	10. A	11. A	12. D				

1. $$\frac{2x^3-6x-4}{x^2-4}=2x+\frac{2x-4}{x^2-4}$$

$$\int\frac{2x^3-6x-4}{x^2-4}dx=\int 2x\,dx+\int\frac{2(x-2)}{(x-2)\cdot(x+2)}\,dx$$

$$=x^2+2\ln|x+2|+C$$

$$=x^2+\ln(x+2)^2+C$$

Yanıt / The Answer is A

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2. $$\frac{3x+1}{x^2-1}=\frac{A}{x-1}+\frac{B}{x+1}$$

$$\left.\begin{matrix}A+B=3\\ A-B=1\end{matrix}\right\}\Rightarrow A=2\ ,\ B=1$$

$$\int\frac{3x+1}{x^2-1}\,dx=\int\frac{2}{x-1}\,dx+\int\frac{dx}{x+1}$$

$$=2\cdot\ln|x-1|+\ln|x+1|+C$$

$$=\ln((x-1)^2\cdot(x+1))+C$$

Yanıt / The Answer is A

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3. $$\frac{1}{x^2-10x+29}=\frac{1}{x^2-10x+25+4}=\frac{1}{(x-5)^2+4}$$

$$\int\frac{dx}{x^2-10x+29}=\int\frac{dx}{4+(x-5)^2}=\frac{1}{4}\int\frac{dx}{1+\left(\frac{x-5}{2}\right)^2}$$

$$\left.\begin{matrix}u=\frac{x-5}{2}\\ du=\frac{1}{2}\,dx\end{matrix}\right\}\Rightarrow\frac{1}{4}\cdot2\int\frac{dx}{1+u^2}=\frac{1}{2}\cdot\arctan u+C$$

$$=\frac{1}{2}\cdot\arctan\frac{x-5}{2}+C$$

Yanıt / The Answer is D

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4. $$\frac{1}{x^2-4}=\frac{A}{x-2}+\frac{B}{x+2}$$

$$\frac{1}{x^2-4}=\frac{(A+B)x+(2A-2B)}{x^2-4}$$

$$\left.\begin{matrix}A+B=0\\ 2A-2B=1\end{matrix}\right\}\Rightarrow A=\frac{1}{4}\ ,\ B=-\frac{1}{4}$$

$$\int\frac{dx}{x^2-4}=\frac{1}{4}\left(\int\frac{dx}{x-2}-\int\frac{dx}{x+2}\right)$$

$$=\frac{1}{4}\left(\ln|x-2|-\ln|x+2|\right)=\frac{1}{4}\ln\left|\frac{x-2}{x+2}\right|+C$$

Yanıt / The Answer is A

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5. $$\frac{x+2}{x^2+x}=\frac{A}{x}+\frac{B}{x+1}$$

$$\frac{x+2}{x^2+x}=\frac{Ax+A+Bx}{x^2+x}\Rightarrow A=2\ ,\ B=-1$$

$$\int\frac{x+2}{x^2+x}\,dx=\int\left(\frac{2}{x}-\frac{1}{x+1}\right)dx$$

$$=2\int\frac{dx}{x}-\int\frac{dx}{x+1}\,dx$$

$$=2\ln|x|-\ln|x+1|$$

$$=\ln\left|\frac{x^2}{x+1}\right|+C$$

Yanıt / The Answer is E

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6. $$\ln x=u\quad\Rightarrow\quad\frac{1}{x}dx=du$$

$$x\,dx=dv\ \Rightarrow\ \frac{x^2}{2}=v$$

$$\int x\cdot\ln x\,dx=\ln x\cdot\frac{x^2}{2}-\frac{1}{4}\int x^2\cdot\frac{1}{x}dx$$

$$=\ln x\cdot\frac{x^2}{2}-\frac{x^2}{4}+C$$

$$=\frac{x^2}{2}\cdot\ln x-\frac{x^2}{4}+C$$

Yanıt / The Answer is C

7. $\int (x^2-x+1)e^x\ dx$

Türev / *Derivative*	İntegral / *Integral*
$+\ x^2-x+1$	e^x
$-\ 2x-1$	e^x
$+\ 2$	e^x
$-\ 0$	e^x

$$\int x^2-x+1)e^x\ dx=(x^2-x+1)\cdot e^x-(2x-1)e^x+2e^x+C$$

$$=e^x(x^2-x+1-2x+1+2)+C$$

$$=e^x(x^2-3x+4)+C$$

Yanıt / The Answer is A

8. $\int x^2\sin x\ dx$

Türev / *Derivative*	İntegral / *Integral*
$+\ x^2$	$\sin x$
$-\ 2x$	$-\cos x$
$+\ 2$	$-\sin x$
$-\ 0$	$\cos x$

$$\int x^2\sin x\ dx=-\cos x\cdot x^2+2\cdot x\sin x+2\cos x$$

$$=\cos x(2-x^2)+2x\cdot\sin x$$

Yanıt / The Answer is B

9. $\int \sin^3 x\ dx=\int \sin^2 x\cdot\sin x\ dx$

$$=\int(1-\cos^2 x)\cdot\sin x\ dx$$

$$\left.\begin{array}{l}u=\cos x\\ du=-\sin x\ dx\end{array}\right\}\Rightarrow\ =-\int(1-u^2)\ du$$

$$=-\left(u-\frac{u^3}{3}\right)+C$$

$$=-\cos x+\frac{\cos^3 x}{3}+C$$

Yanıt / The Answer is D

10. $\cos x\cdot\cos 3x=\frac{1}{2}\cdot[\cos(x+3x)+\cos(3x-x)]$

$$=\frac{1}{2}\cdot[\cos 4x+\cos 2x]$$

$$\int(\cos x\cdot\cos 3x)dx=\int\frac{1}{2}(\cos 4x+\cos 2x)\ dx$$

$$=\frac{1}{2}\left(\frac{1}{4}\sin 4x+\frac{1}{2}\sin 2x\right)+C$$

$$=\frac{1}{8}\sin 4x+\frac{1}{4}\sin 2x+C$$

$$=\frac{\sin 2x}{4}+\frac{\sin 4x}{8}+C$$

Yanıt / The Answer is A

11. $$\left.\begin{array}{l}u=\cos^2 x\\ du=-\sin 2x\ dx\end{array}\right\}\Rightarrow\ \int\cos(\cos^2 x)\sin 2x\ dx=-\int\cos u\ du$$

$$=-\sin u+C$$

$$=-\sin(\cos^2 x)+C$$

Yanıt / The Answer is A

12. $\sin x=u \qquad e^x dx=du$

$\cos x dx=du \qquad e^x=v$

$$\int e^x\sin x\ dx=\sin x\cdot e^x-\int e^x\cdot\cos x\ dx$$

$\cos x=u \qquad e^x dx=du$

$-\sin x dx=du \qquad e^x=v$

$$\int e^x\cdot\sin x=I\ \Rightarrow I=\sin x\cdot e^x-(\cos x\cdot e^x)+\int\sin x\cdot e^x\ dx$$

$$I=\sin x\cdot e^x-\cos x e^x-I$$

$$2I=(\sin x-\cos x)e^x$$

$$I=\frac{(\sin x-\cos x)e^x}{2}+C$$

Yanıt / The Answer is D

1. $\int (2x+1)f(x)\ dx = 2x^3+5x^2+10x+C \Rightarrow \mathbf{f(-1) = ?}$

Yanıt / The Answer is: **–6**

2. $f'(x) = 4x^3 + 6x^2 + 2x + 3$ ve(and) $f(2) = 56 \Rightarrow \mathbf{f(x) = ?}$

Yanıt / The Answer is: $\mathbf{x^4 + 2x^3 + x^2 + 3x + 14}$

3. $\int \frac{x^2-1}{x^2+1}dx = ?$

Yanıt / The Answer is: $\mathbf{x - 2 \cdot \arctan x + C}$

4. $\int \frac{3x}{3x+4}dx = ?$

Yanıt / The Answer is: $\mathbf{x - \frac{4}{3}\ln|3x+4| + C}$

5. $\int \frac{2x+3}{x^2+3x+4}dx = ?$

Yanıt / The Answer is: $\mathbf{\ln|x^2+3x+4|+C}$

6. $\int \frac{x}{(x^2+3)^3}dx = ?$

Yanıt / The Answer is: $\mathbf{\frac{-1}{4(x^2+3)^2}+C}$

7. $\int \frac{\operatorname{cosec}^2 x}{1+\cot x} dx = ?$

Yanıt / The Answer is: $-\ln|1+\cot x|+C$

8. $\int \frac{x^2-4}{x^2+4} dx = ?$

Yanıt / The Answer is: $x-4\cdot\arctan\frac{x}{2}+C$

9. $\int x \cdot e^{-x^2} dx = ?$

Yanıt / The Answer is: $-\frac{1}{2}e^{-x^2}+C$

10. $\int \frac{2x+1}{x^2+x-2} dx = ?$

Yanıt / The Answer is: $\ln|x^2+x-2|+C$

11. $\int \frac{e^x dx}{1+e^{2x}} = ?$

Yanıt / The Answer is: $\arctan e^x + C$

12. $\int \frac{x-3}{x^2-4x-5} dx = ?$

Yanıt / The Answer is: $\ln\sqrt[3]{(x+1)^2\,|x-5|}+C$

13. $\int \frac{2x^2+4x+1}{2x^2+1}\,dx = ?$

Yanıt / The Answer is: $\mathbf{x + \ln|2x^2+1| + c}$

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14. $f'(x) = 4x^3 - 3x^2 - 1$ ve(and) $f(1) = 2 \Rightarrow \mathbf{f(3) = ?}$

Yanıt / The Answer is: **54**

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15. $\int (x + f(x))\,dx = x^2 + ax + b,\ f(3) = 5 \Rightarrow \mathbf{a = ?}$

Yanıt / The Answer is: **2**

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16. $\int \frac{1}{x \cdot \ln x}\,dx = ?$

Yanıt / The Answer is: $\mathbf{\ln|\ln x| + c}$

---

17. $\int \frac{\sin x}{\cos^2 x}\,dx = ?$

Yanıt / The Answer is: $\frac{1}{\cos x} + c$

---

18. $\int \frac{dx}{\sqrt{4-(x-3)^2}} = ?$

Yanıt / The Answer is: $\mathbf{\arcsin\frac{x-3}{2} + c}$

19. $\int (3x^2 + 2\sqrt{x} + 4)\, dx = ?$

Yanıt / The Answer is: $x^3 + \frac{4}{3}\sqrt{x^3} + 4x + C$

20. $\int \sec x \, dx = ?$

Yanıt / The Answer is: **$\ln |\sec x + \tan x| + C$**

21. $\int \frac{\cos 2x}{\sin^2 x}\, dx = ?$

Yanıt / The Answer is: **$-2x - \cot x + C$**

22. $\int \frac{1}{x^2 + 10x + 26}\, dx = ?$

Yanıt / The Answer is: **$\arctan(x + 5) + C$**

23. $\int \frac{dx}{1 + \cos 2x} = ?$

Yanıt / The Answer is: $\frac{1}{2}\tan x + C$

24. $\int \sin 2x \cdot \cos x \, dx = ?$

Yanıt / The Answer is: $-\frac{2\cos^3 x}{3} + C$

25. $\int \left(\frac{3}{\sin^2 x} + \frac{1}{1+x^2} \right) dx = ?$

Yanıt / The Answer is: $-3\cot x + \arctan x + C$

26. $\int (x^2 + x) \cdot e^x \, dx = ?$

Yanıt / The Answer is: $e^x (x^2 - x + 1) + C$

27. $\int x^3 \cdot e^{2x} \, dx = ?$

Yanıt / The Answer is: $e^{2x} \left(\frac{x^3}{2} - \frac{3x^2}{4} + \frac{3x}{4} - \frac{3}{8} \right) + C$

28. $\int x^2 \cdot \ln x \, dx = ?$

Yanıt / The Answer is: $\frac{x^3}{3} \left(\ln x - \frac{1}{3} \right) + C$

29. $\int x \cdot (x-1)^8 \, dx = ?$

Yanıt / The Answer is: $\frac{(x-1)^{10}}{10} - \frac{(x-1)^9}{9} + C$

30. $\int \sin^2 x \cdot \cos^2 x \, dx = ?$

Yanıt / The Answer is: $\frac{x}{8} - \frac{1}{32} \sin 4x + C$

31. $\int \cos 4x \cdot \cos 2x \, dx = ?$

Yanıt / The Answer is: $\frac{1}{12}\sin 6x + \frac{1}{4}\sin 2x + C$

32. $\int \sin 5x \cdot \sin 2x \, dx = ?$

Yanıt / The Answer is: $\frac{1}{6}\sin 3x - \frac{1}{14}\sin 7x + C$

33. $\int \left(x^2 + 2x\right) \cdot \cos x \, dx = ?$

Yanıt / The Answer is: $\sin x(x^2 + 2x - 2) + (2x + 2)\cdot\cos x + C$

34. $\int \frac{dx}{4x - x^2} = ?$

Yanıt / The Answer is: $\ln\left|\frac{x}{4-x}\right| + C$

35. $\int \tan 2x \, dx = ?$

Yanıt / The Answer is: $-\frac{1}{2}\ln|\cos 2x| + C$

36. $\int \cos^5 x \, dx = ?$

Yanıt / The Answer is: $\sin x - \frac{2\sin^3 x}{3} + \frac{\sin^5 x}{5} + C$

1. $f''(x) = 24x^2 - 36x + 12$

$f'(0) = 1,$

$f(0) = -2 \Rightarrow$ **$f(-1) = ?$**

A) 8

B) 9

C) 10

D) 11

E) 12

2. $\displaystyle\int \frac{x^3 - 3x^2 + x}{x}\,dx = ?$

A) $\dfrac{x^3}{2} - \dfrac{x^2}{3} + x + C$

B) $\dfrac{x^4}{4} - x^3 + x^2 + C$

C) $x^3 - \dfrac{x^2}{3} + \dfrac{x}{2} + C$

D) $\dfrac{x^3}{3} - \dfrac{3x^2}{2} + x + C$

E) $\dfrac{x^3}{3} + \dfrac{x^2}{2} + C$

3. $\displaystyle\int (ax^3 - bx^2 + x + 4)\,dx = ?$

A) $\dfrac{ax^4}{4} + \dfrac{bx^3}{3} + \dfrac{x^2}{2} + 4x + C$

B) $\dfrac{ax^3}{2} + \dfrac{bx^2}{2} + \dfrac{x}{2} + 4x + C$

C) $\dfrac{ax^4}{4} - \dfrac{bx^3}{3} + \dfrac{x^2}{2} + 4x + C$

D) $\dfrac{ax^2}{4} - \dfrac{bx^3}{3} + \dfrac{x^2}{2} + C$

E) $\dfrac{ax^4}{4} - \dfrac{bx^3}{3} + 4x + C$

4. $\displaystyle\int \left(x^2 - \frac{3}{x^4} + 5\right) dx = ?$

A) $\dfrac{x^3}{3} + \dfrac{1}{x^3} + 5x + C$

B) $\dfrac{x^3}{3} - \dfrac{15}{x^5} + 5x + C$

C) $x^3 - \dfrac{1}{5x^5} + 5x + C$

D) $\dfrac{x^3}{3} - \dfrac{3}{5x^5} + 5x + C$

E) $\dfrac{x^3}{3} - \dfrac{9}{x^3} + 5x + C$

5. $\displaystyle\int x\cdot(x-2)^2\,dx = ?$

A) $\dfrac{x^4}{4} - \dfrac{x^3}{3} + \dfrac{x^2}{2} + C$

B) $\dfrac{x^4}{4} - \dfrac{4x^3}{3} + 2x^2 + C$

C) $\dfrac{x^4}{12} - \dfrac{x^3}{9} + x^2 + C$

D) $\dfrac{x^4}{3} - \dfrac{x^3}{2} + x^2 + C$

E) $\dfrac{x^4}{6} - \dfrac{x^3}{12} + \dfrac{x^2}{3} + C$

6. $\displaystyle\int \left(e^{2x} + 3^x\right) dx = ?$

A) $\dfrac{e^{3x}}{3} + \dfrac{3^x}{\ln 3} + C$

B) $\dfrac{e^{2x}}{2} + 3^x + C$

C) $\dfrac{e^{3x}}{3} + \dfrac{3\cdot 3^x}{\ln 3} + C$

D) $\dfrac{e^{2x}}{2} + \dfrac{3^x}{3\ln 3} + C$

E) $\dfrac{e^{2x}}{2} + \dfrac{3^x}{\ln 3} + C$

7. $\int \frac{d(\cos x)}{\sin x} = ?$

A) $\ln|\sin x| + C$

B) $\frac{\sin^2 x}{2} + C$

C) $\tan x + C$

D) $x^2 + C$

E) $-x + C$

8. $\frac{d^2f(x)}{dx^2} = -x^2 - 2x,\ \frac{df(1)}{dx} = 0,\ f(1) = 1 \Rightarrow$ **f(x) = ?**

A) $f(x) = -\frac{1}{6}x^3 - \frac{1}{3}x^2 + \frac{4}{3}x + 2$

B) $f(x) = -\frac{1}{12}x^3 - \frac{1}{6}x^2 + \frac{4}{3}x + 1$

C) $f(x) = -\frac{1}{12}x^3 - \frac{1}{3}x^2 + \frac{4}{3}x - \frac{1}{24}$

D) $f(x) = -\frac{1}{12}x^4 - \frac{1}{3}x^3 + \frac{4}{3}x + \frac{1}{12}$

E) $f(x) = -\frac{1}{12}x^4 - \frac{1}{3}x^3 + \frac{1}{2}x^2 + \frac{4}{3}x + \frac{1}{12}$

9. $\frac{d^3f(x)}{dx^3} = e^x + 1,\ \frac{d^2f(0)}{dx^2} = 1,\ \frac{df(0)}{dx} = 2,\ f(0) = 3 \Rightarrow$ **f(x) = ?**

A) $f(x) = e^x + \frac{x^2}{3} + x + 9$

B) $f(x) = e^x + \frac{x^2}{3} + 3x + 6$

C) $f(x) = 2e^x + \frac{x \cdot e^x}{3} + x^2 \cdot e^x + 12$

D) $f(x) = e^x + \frac{e^{2x}}{3} + x \cdot e^x + 6$

E) $f(x) = e^x + \frac{1}{6}x^3 + x + 2$

10. $\int (2\sin x + 5^x)dx = ?$

A) $2\sin x + \ln 5 + C$

B) $-2\sin x + \frac{5^x}{5} + C$

C) $2\cos x + \frac{5^x}{\ln 5} + C$

D) $-2\cos x + \frac{5^x}{\ln 5} + C$

E) $-2\sin x + 5^x \cdot \ln 5 + C$

11. $\int \left(\frac{-2}{\sin^2 x} + \frac{5}{\cos^2 x} \right) dx = ?$

A) $5 \cdot \tan x - 2 \cdot \cot x + C$

B) $2 \cdot \tan x - 2 \cdot \cot x + C$

C) $2 \cdot \cot x - 5 \cdot \tan x + C$

D) $2 \cdot \tan x + 5 \cdot \cot x + C$

E) $5 \cdot \tan x + 2 \cdot \cot x + C$

12. $\int \frac{2^{3x} + 1}{2^{2x} - 2^x + 1} dx = ?$

A) $2^x \cdot \ln 2 + C$

B) $\frac{2^x}{\ln 2} + x + C$

C) $2^x \cdot \ln 2 + x + C$

D) $\frac{2^x}{\ln 2} + C$

E) $\frac{2^x}{\ln 2} - x + C$

YANITLAR / ANSWERS							
1. D	2. D	3. C	4. A	5. B	6. E	7. E	8. D
9. E	10. D	11. E	12. B				

1. $\int (x^2-3x+5)^3\cdot(2x-3)\,dx=?$

A) $\frac{(x^2-3x+5)^2}{2}+C$

B) $\frac{(x^2-3x)^4}{4}+x+C$

C) $\frac{(x^2-3x+5)\cdot x^2}{4}+C$

D) $\frac{(x^2-3x+5)^4}{4}+C$

E) $\frac{(x^2-3x+5)\cdot(x^2-3x)}{8}+C$

2. $\int \sqrt{x^2+3x+1}\cdot(2x+3)\,dx=?$

A) $-2(x^2+3x+1)^{-\frac{1}{2}}+C$

B) $2(x^2+3x+1)^{\frac{1}{2}}+C$

C) $\frac{2}{3}\cdot(x^2+3x+1)^{\frac{3}{2}}+C$

D) $\frac{2}{5}\cdot(x^2+3x+1)^{\frac{5}{2}}+C$

E) $(x^2+3x+1)^{\frac{3}{2}}\cdot(x^2+3x)+C$

3. $\int \cos(2x-1)\,dx=?$

A) $\frac{\sin(2x-1)}{2}+C$

B) $\frac{-\sin(2x-1)}{2}+C$

C) $\frac{\cos(2x-1)}{2}+C$

D) $\frac{-\cos(2x-1)}{2}+C$

E) $\frac{\tan(2x-1)}{2}+C$

4. $\int \frac{dx}{x-2}=?$

A) $\frac{(x-2)^2}{2}+C$

B) $\frac{1}{2(x-2)^2}+C$

C) $\ln|x-2|+C$

D) $\frac{1}{2x^2}-\frac{1}{2x}+C$

E) $\frac{1}{3(x-2)^3}+C$

5. $\int \cot x\,dx=?$

A) $\ln|\sin x|+C$

B) $\ln|\cos x|+C$

C) $\ln|\tan x|+C$

D) $\ln|\cot x|+C$

E) $\frac{\cot^2 x}{2}+C$

6. $\int\left(\frac{1}{x}-\frac{2x}{x^2+1}\right)dx=?$

A) $\ln\left|\frac{x}{x+1}\right|+C$

B) $\ln\left|\frac{x^2}{x-1}\right|+C$

C) $\ln\left|\frac{x^2}{x+1}\right|+C$

D) $\ln\left|\frac{x}{x^2+1}\right|+C$

E) $\ln\left|\frac{x^2}{x-2}\right|+C$

7. $\int (12x^2-5x+3)\cdot(8x^3-5x^2+6x-3)^4\,dx=?$

A) $\frac{(8x^3-5x^2+6x-3)^5}{10}+C$

B) $\frac{(8x^3-5x^2+6x-3)^5}{5}+C$

C) $10(8x^3-5x^2+6x-3)^5+C$

D) $5(8x^3-5x^2+6x-3)+C$

E) $\ln|8x^3-5x^2+6x-3|+C$

8. $\int \frac{3x^5-2x^3-3x}{(x^6-x^4-3x^2)^3}\,dx=?$

A) $\frac{\ln|x^6-x^4-3x^2|}{3}+C$

B) $\frac{\ln|x^6-x^4-3x^2|}{9}+C$

C) $\frac{-1}{3(x^6-x^4-3x^2)^4}+C$

D) $\frac{-1}{6(x^6-x^4-3x^2)^4}+C$

E) $\frac{-1}{4(x^6-x^4-3x^2)^2}+C$

9. $\int \sin^4 x\cdot\cos x\,dx=?$

A) $\frac{\sin^5 x}{5}+C$

B) $\frac{\cos^5 x}{5}+C$

C) $\frac{-\sin^5 x}{5}+C$

D) $\frac{-\cos^5 x}{5}+C$

E) $\frac{\tan^5 x}{5}+C$

10. $\int \frac{\ln^3 x}{x}\,dx=?$

A) $\frac{\ln^2 x}{2}+C$

B) $\frac{\ln^3 x}{3}+C$

C) $\frac{\ln^4 x}{4}+C$

D) $\frac{2}{\ln^2 x}+C$

E) $\ln|\ln x|+C$

11. $\int \frac{e^{5x}}{e^{5x}+5}\,dx=?$

A) $\frac{(e^{5x}+5)^2}{10}+C$

B) $\frac{-1}{10(e^{5x}+5)^2}+C$

C) $\frac{\ln|e^{5x}+5|}{5}+C$

D) $\ln|e^{5x}+5|+C$

E) $\frac{\ln(e^{5x}+5)^2}{10}+C$

12. $\int \frac{3x^2+4}{\left(x^3+4x\right)^2}\,dx=?$

A) $\ln|x^3+4x|+C$

B) $\ln|3x^2+4|+C$

C) x^3+4x+C

D) $-x^3-4x+C$

E) $-\frac{1}{x^3+4x}+C$

YANITLAR / ANSWERS

1. D	**2. C**	**3. A**	**4. C**	**5. A**	**6. D**	**7. A**	**8. E**
9. A	**10. C**	**11. C**	**12. E**				

1. $\int \frac{\sin(\ln x)}{x}\,dx = ?$

A) $-\cos(\ln x) + C$
B) $\cos(\ln x) + C$
C) $-\sin(\ln x) + C$
D) $\sin(\ln x) + C$
E) $\sin x + \ln x + C$

2. $\int \frac{\sin 5x}{1+\cos 5x}\,dx = ?$

A) $\ln|1+\cos 5x| + C$
B) $\frac{1}{5}\ln|1+\cos 5x| + C$
C) $-\frac{1}{5}\ln|1+\cos 5x| + C$
D) $-\frac{1}{5}\ln|1+\cos x| + C$
E) $\frac{1}{5}\ln|1+\cos x| + C$

3. $\int \frac{dx}{\sqrt{x}\cdot(1+x)} = ?$

A) $\frac{2x^{\frac{3}{2}}}{3} + \frac{2x^{\frac{5}{2}}}{5} + C$
B) $-\frac{2x^{\frac{3}{2}}}{3} - \frac{2x^{\frac{5}{2}}}{5} + C$
C) $2\cdot\arctan x + C$
D) $-2\cdot\arctan\sqrt{x} + C$
E) $2\cdot\arctan\sqrt{x} + C$

4. $\int \frac{\sin^3 x}{\cos^5 x}\,dx = ?$

A) $\tan x + C$
B) $\frac{\tan^2 x}{2} + C$
C) $\frac{\tan^3 x}{3} + C$
D) $\frac{\tan^4 x}{4} + C$
E) $\frac{\tan^5 x}{5} + C$

5. $\int \frac{\sin 4x}{e^{\cos^2 2x}}\,dx = ?$

A) $\frac{1}{2}e^{\cos^2 2x} + C$
B) $\frac{1}{2}e^{\sin^2 2x} + C$
C) $-\frac{1}{2}e^{\sin^2 2x} + C$
D) $-\frac{1}{2}e^{\cos^2 2x} + C$
E) $e^{\cos^2 2x} + C$

6. $\int e^{\cos x + 4}\cdot\sin x\,dx = ?$

A) $e^{\cos x + 4} + C$
B) $-e^{\cos x + 4} + C$
C) $-e^{\cos x} + C$
D) $2e^{\cos x + 4} + C$
E) $e^{\cos x + 4} + \sin x + C$

7. $\int \frac{\arctan x}{1+x^2}\,dx = ?$

A) $\arctan^2 x + C$

B) $\arctan x + C$

C) $\frac{1}{2}\arctan x + C$

D) $-\frac{1}{2}\arctan x + C$

E) $\frac{1}{2}\arctan^2 x + C$

8. $\int \frac{dx}{\cos^2 4x} = ?$

A) $\tan 4x + C$

B) $\frac{1}{4}\tan x + C$

C) $\frac{1}{4}\tan 4x + C$

D) $\frac{1}{12}\cos^3 x + C$

E) $-\frac{1}{4}\cos^3 x + C$

9. $\int \frac{dx}{1+\sin x} = ?$

A) $\tan x + \frac{1}{\cos x} + C$

B) $\tan x - \frac{1}{\cos x} + C$

C) $\ln|1+\sin x| + C$

D) $\tan x - \ln|\cos x| + C$

E) $\ln|\cos^2 x| + C$

10. $\int \frac{\sin 2x}{\sqrt{1-\sin^4 x}}\,dx = ?$

A) $-\arcsin(\sin^2 x) + C$

B) $\arcsin(\sin^2 x) + C$

C) $\arcsin(\cos^2 x) + C$

D) $-\arcsin(\cos^2 x) + C$

E) $\arccos(\sin^2 x) + C$

11. $\int \frac{x^7}{1-x^4}\,dx = ?$

A) $-\frac{1}{4}(\ln(1-x^4)+x^4)+C$

B) $\frac{1}{4}(\ln(1-x^4)+x^4)+C$

C) $\frac{1}{4}(\ln(1-x^4)-1+x^4)+C$

D) $-\frac{1}{4}(\ln(1-x^4)-1+x^4)+C$

E) $\frac{1}{4}(\ln(1-x^4)-1)+C$

12. $\int \frac{dx}{\sqrt{x(1-x)}} = ?$

A) $\arcsin(1-2x) + C$

B) $-\arcsin(1-2x) + C$

C) $\arcsin(1-x) + C$

D) $-\arcsin(1-x) + C$

E) $\arcsin(1-x) + \sqrt{x} + C$

YANITLAR / ANSWERS

1. A	**2. C**	**3. E**	**4. D**	**5. A**	**6. B**	**7. E**	**8. C**
9. B	**10. B**	**11. A**	**12. B**				

1. $\int \frac{dx}{\sqrt{4-x^2}} = ?$

A) $\frac{\arcsin\frac{x}{2}}{2} + C$

B) $2\arcsin\frac{x}{2} + C$

C) $\arcsin\frac{x}{2} + C$

D) $2\arctan\frac{x}{2} + C$

E) $\arctan\frac{x}{2} + C$

2. $\int \frac{dx}{\sqrt{7+6x-x^2}} = ?$

A) $\arcsin(x-7)(x-6) + C$

B) $\arcsin\frac{x-3}{2} + C$

C) $\arcsin\frac{x-3}{3} + C$

D) $\arcsin\frac{x-3}{4} + C$

E) $\arcsin\frac{x-3}{6} + C$

3. $\int \frac{x}{\sqrt{1-x^4}}\,dx = ?$

A) $\frac{\arcsin x^2}{2} + C$

B) $\frac{\arcsin x^3}{3} + C$

C) $\frac{\arcsin x^4}{4} + C$

D) $\arcsin(1-x^2) + C$

E) $\arctan x^4 + C$

4. $\int \frac{dx}{25+x^2} = ?$

A) $\arctan 5x + C$

B) $\arctan(5x)^2 + C$

C) $\frac{\arctan^5 x}{5} + C$

D) $\arctan\frac{x}{5} + C$

E) $\frac{\arctan\frac{x}{5}}{5} + C$

5. $\int \frac{x-4}{x^2+4}\,dx = ?$

A) $\frac{\ln|x^2-4|}{2} - 4\arctan\frac{x}{2} + C$

B) $\frac{\ln|x^2+4|}{2} - 2\arctan\frac{x}{2} + C$

C) $\ln|x-4| - 4\arctan\frac{x}{2} + C$

D) $\ln|x+4| - 4\arctan(x-4) + C$

E) $\ln|x^2+4| - 8\arctan(x^2+4) + C$

6. $\int \frac{dx}{x^2+6x+9} = ?$

A) $\ln|x+3| + C$

B) $\frac{-1}{x+3} + C$

C) $\frac{-2}{(x+3)^2} + C$

D) $\arctan(x+3) + C$

E) $\frac{\arctan(x+3)}{3} + C$

7. $\int \frac{dx}{x^2-5x+6} = ?$

A) $\ln\left|\frac{x-3}{x-2}\right| + C$

B) $\ln\left|\frac{x-2}{x-3}\right| + C$

C) $\ln\left|\frac{x-6}{x+1}\right| + C$

D) $\ln\left|\frac{x+1}{x-6}\right| + C$

E) $\ln\left|\frac{x-2}{x+3}\right| + C$

8. $\int \frac{x^3-2x^2+1}{x-1}\,dx = ?$

A) $\frac{x^3}{3} - x^2 + \ln(x-1) + C$

B) $\frac{x^3}{3} - x + \ln(x-1) + C$

C) $\frac{x^3}{3} + \frac{x^2}{2} + 2x + C$

D) $\frac{x^3}{3} - \frac{x^2}{2} - x + C$

E) $\frac{x^3}{3} - x^2 + 3x + C$

9. $\int \frac{dx}{x(x-2)} = ?$

A) $\ln\left|\frac{x}{x-2}\right| + C$

B) $\ln\left|\frac{x-2}{x}\right| + C$

C) $-\ln\left|\frac{x}{x-2}\right| + C$

D) $-\ln\left|\frac{x-2}{x}\right| + C$

E) $\frac{1}{2}\ln\left|\frac{x-2}{x}\right| + C$

10. $\int \frac{dx}{\sqrt{4-x^2}} = ?$

A) $\arcsin\frac{x}{2} + C$

B) $2\arcsin\frac{3x}{2} + C$

C) $\arctan\sqrt{x} + C$

D) $\arcsin\sqrt{x} + C$

E) $2\arcsin\sqrt{x} + C$

11. $0 < x < \frac{\pi}{2} \Rightarrow \int \sqrt{36-4x^2}\,dx = ?$

A) $x \cdot \sqrt{9-x^2} + \arcsin\frac{x}{3} + C$

B) $9x \cdot \sqrt{9-x^2} + \arcsin\frac{x}{3} + C$

C) $x \cdot \sqrt{9-x^2} + 9\arcsin\frac{x}{3} + C$

D) $x \cdot \sqrt{9-x^2} + \frac{x}{3} + C$

E) $x \cdot \sqrt{9-x^2} + \arcsin x + C$

12. $0 < x < \frac{\pi}{2} \Rightarrow \int 3\sin^2(\pi-x)\cdot\cos(\pi+x)\,dx = ?$

A) $\frac{\sin^3 x}{3} + C$ B) $\frac{\cos^3 x}{3} + C$ C) $\frac{\tan^2 x}{2} + C$

D) $-\frac{\sin^3 x}{3} + C$ E) $-\sin^3 x + C$

YANITLAR / ANSWERS

1. C	2. D	3. A	4. E	5. B	6. B	7. A	8. D
9. E	10. A	11. C	12. E				

1. $\int_{-2}^{3} x^2 \, dx = ?$

A) $\frac{32}{3}$

B) $\frac{34}{3}$

C) $\frac{35}{3}$

D) $\frac{37}{3}$

E) $\frac{38}{3}$

2. $\int_{-1}^{1} (4x^3 - 2x + 7) \, dx = ?$

A) –14

B) –7

C) 0

D) 7

E) 14

3. $\int_{\ln 2}^{\ln 8} e^{2x} \, dx = ?$

A) 24

B) 26

C) 28

D) 30

E) 32

4. $\int_{-1}^{1} \frac{1}{1+x^2} \, dx = ?$

A) $\frac{\pi}{2}$

B) $\frac{\pi}{3}$

C) $\frac{\pi}{4}$

D) $\frac{\pi}{5}$

E) $\frac{\pi}{6}$

5. $\int_{1}^{e^3} \frac{dx}{x} = ?$

A) 4

B) 3

C) 2

D) 1

E) 0

6. $\int_{\frac{\pi}{2}}^{\pi} \sin 3x \, dx = ?$

A) $\frac{1}{5}$

B) $\frac{1}{4}$

C) $\frac{1}{3}$

D) $\frac{1}{2}$

E) 1

7. $\int_{-2}^{4} |x-2|\,dx = ?$

A) 8
B) 10
C) 12
D) 14
E) 16

8. $\int_{-3}^{1} |x+2|\,dx = ?$

A) –2
B) 0
C) 2
D) 5
E) 6

9. $\int_{0}^{\pi} \cos x\,dx = ?$

A) –1
B) $-\frac{1}{2}$
C) 0
D) $\frac{1}{2}$
E) 1

10. $\int_{a}^{b} (4x-1)\,dx = 12,\ a-b=-4 \Rightarrow \mathbf{a \cdot b = ?}$

A) 4
B) 3
C) 0
D) –3
E) –4

11. $\int_{0}^{\frac{\pi}{4}} (\cos^2 x - \sin^2 x)\,dx = ?$

A) $\frac{1}{4}$
B) $\frac{1}{2}$
C) $\frac{1}{3}$
D) $\frac{1}{5}$
E) 1

12. $\frac{d}{dx}\left(\int_{1}^{8} (x^3-5x)\,dx\right) = ?$

A) –2
B) –1
C) 0
D) 1
E) 2

YANITLAR / ANSWERS

1. C	2. E	3. D	4. A	5. B	6. C	7. B	8. D
9. C	10. D	11. B	12. C				

1. $\displaystyle\int_{-2}^{3} x^2\,dx = \frac{x^3}{3}\Bigg|_{-2}^{3} = \left(\frac{3^3}{3} - \frac{(-2)^3}{3}\right)$

$$= 9 + \frac{8}{3} = \frac{35}{3}$$

Yanıt / The Answer is C

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2. $\displaystyle\int_{-1}^{1} (4x^3 - 2x + 7)\,dx = \frac{4x^4}{4} - \frac{2x^2}{2} + 7x\Bigg|_{-1}^{1}$

$$= x^4 - x^2 + 7x\Bigg|_{-1}^{1}$$

$$= (1^4 - 1^2 + 7\cdot 1) - ((-1)^4 - (-1)^2 + 7\cdot(-1))$$

$$= 7 + 7 = 14$$

Yanıt / The Answer is E

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3. $\displaystyle\int_{\ln 2}^{\ln 8} e^{2x}\,dx = \frac{1}{2}e^{2x}\Bigg|_{\ln 2}^{\ln 8}$

$$= \frac{1}{2}\left(e^{2\ln 8} - e^{2\ln 2}\right)$$

$$= \frac{1}{2}(64 - 4) = 30$$

Yanıt / The Answer is D

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4. $\displaystyle\int_{-1}^{1} \frac{1}{1+x^2}\,dx = \arctan x\Bigg|_{-1}^{1}$

$$= \arctan 1 - \arctan(-1)$$

$$= \left(\frac{\pi}{4} - \left(-\frac{\pi}{4}\right)\right) = \frac{\pi}{2}$$

Yanıt / The Answer is A

---

5. $\displaystyle\int_{1}^{e^3} \frac{dx}{x} = \ln x\Bigg|_{1}^{e^3} = (\ln e^3 - \ln 1)$

$$= 3 - 0 = 3$$

Yanıt / The Answer is B

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6. $\displaystyle\int_{\frac{\pi}{2}}^{\pi} \sin 3x\,dx = -\frac{1}{3}\cos 3x\Bigg|_{\frac{\pi}{2}}^{\pi}$

$$= -\frac{1}{3}\left[\cos 3\pi - \cos\frac{3\pi}{2}\right]$$

$$= -\frac{1}{3}[-1-0] = \frac{1}{3}$$

Yanıt / The Answer is C

7. $x-2=0 \Rightarrow x=2$

$$\begin{array}{c|ccc} x & & 2 & \\ \hline x-2 & - & \circ & + \end{array}$$

$$\int_{-2}^{4} |x-2|\,dx = \int_{-2}^{2} (2-x)\,dx + \int_{2}^{4} (x-2)\,dx$$

$$= \left(2x-\frac{x^2}{2}\right)\Big|_{-2}^{2} + \left(\frac{x^2}{2}-2x\right)\Big|_{2}^{4}$$

$$= (2-(-6)) + (0-(-2))$$

$$= 10$$

Yanıt / The Answer is B

8. $x+2=0 \Rightarrow x=-2$

$$\begin{array}{c|ccc} x & & -2 & \\ \hline x+2 & - & \circ & + \end{array}$$

$$\int_{-3}^{1} |x+2|\,dx = \int_{-3}^{-2} (-x-2)\,dx + \int_{-2}^{1} (x+2)\,dx$$

$$= -\frac{x^2}{2}-2x\,\Big|_{-3}^{-2} + \frac{x^2}{2}+2x\,\Big|_{-2}^{1}$$

$$= \frac{1}{2}+\frac{9}{2} = \frac{10}{2} = 5$$

Yanıt / The Answer is D

9. $$\int_{0}^{\pi} \cos x\,dx = \sin x\,\Big|_{0}^{\pi} = \sin\pi - \sin 0 = 0$$

Yanıt / The Answer is C

10. $$\int_{a}^{b} (4x-1)dx = 12 \Rightarrow \left(\frac{4x^2}{2}-x\right)\Big|_{a}^{b} = 12$$

$$(2b^2-b)-(2a^2-a) = 12$$

$$2b^2-b-2a^2+a = 12$$

$$2\cdot(b^2-a^2)+a-b = 12$$

$$2\cdot(b-a)\cdot(b+a)+a-b = 12$$

$$2\cdot 4\cdot(b+a)-4 = 12$$

$$8\cdot(b+a) = 16$$

$$\begin{array}{rl} & b+a = 2 \\ + & a-b = -4 \\ \hline & 2a = -2 \Rightarrow a=-1\,,\ b=3 \end{array}$$

$a\cdot b = -1\cdot 3 = = -3$

Yanıt / The Answer is D

11. $$\int_{0}^{\frac{\pi}{4}} (\cos^2 x-\sin^2 x)dx = \int_{0}^{\frac{\pi}{4}} \cos 2x\,dx$$

$$= \frac{1}{2}(\sin 2x)\Big|_{0}^{\frac{\pi}{4}}$$

$$= \frac{1}{2}\left(\sin\frac{\pi}{2}-\sin 0\right)$$

$$= \frac{1}{2}(1-0) = \frac{1}{2}$$

Yanıt / The Answer is B

12. $$\int_{1}^{8} (x^3-5x^2)\,dx = a\,,\ a\in R \Rightarrow \frac{d}{dx}a = 0$$

Yanıt / The Answer is C

1. $\int_{\frac{\pi}{3}}^{\frac{\pi}{2}} \cot x \, dx = ?$

A) $-\ln\frac{1}{2}$ B) $-\ln\frac{\sqrt{3}}{2}$ C) $\ln\frac{1}{2}$

D) $\ln\frac{\sqrt{3}}{2}$ E) 0

2. $\int_{1}^{e^2} \frac{\ln^2 x}{x} \, dx = ?$

A) $\frac{8}{3}$ B) $\frac{10}{3}$ C) $\frac{11}{3}$

D) $\frac{14}{3}$ E) $\frac{16}{3}$

3. $\int_{0}^{1} \frac{x^2+1}{x^3+3x+5} \, dx = ?$

A) $\frac{1}{2}\ln\frac{9}{2}$ B) $\frac{1}{3}\ln\frac{8}{3}$ C) $\frac{1}{3}\ln\frac{9}{5}$

D) $\frac{1}{4}\ln\frac{9}{7}$ E) $\frac{1}{4}\ln\frac{12}{5}$

4. $\int_{0}^{\frac{\pi}{2}} \frac{\cos x \, dx}{(1+\sin x)^3} = ?$

A) $\frac{1}{8}$ B) $\frac{1}{4}$ C) $\frac{3}{8}$

D) $\frac{1}{2}$ E) $\frac{3}{4}$

5. $\int_{0}^{2} \frac{dx}{4+x^2} = ?$

A) $\frac{\pi}{4}$ B) $\frac{3\pi}{4}$ C) $\frac{\pi}{8}$

D) 2 E) $\frac{1}{8}$

6. $\int_{0}^{\pi} \frac{dx}{x^2-4} = ?$

A) $2 \cdot \ln\left|\frac{\pi+2}{\pi-2}\right|$ B) $\frac{1}{4} \cdot \ln\left|\frac{\pi-2}{\pi+2}\right|$

C) $\frac{1}{4} \cdot \ln\left|\frac{\pi+2}{\pi-2}\right|$ D) $\frac{1}{2} \cdot \ln\left|\frac{\pi+2}{\pi-2}\right|$

E) $\frac{1}{2} \cdot \ln\left|\frac{\pi-2}{\pi+4}\right|$

7. $\int_{0}^{\frac{\pi}{2}} \cos^2 x\,dx = ?$

A) $\frac{\pi}{6}$ B) $\frac{\pi}{4}$ C) $\frac{\pi}{3}$ D) $\frac{\pi}{2}$ E) π

8. $\int_{1}^{e^2} x \cdot \ln x \cdot dx = ?$

A) $\frac{e^2-1}{4}$ B) $\frac{4e^4-e^2+1}{4}$ C) $\frac{4e^4-e^2}{4}$ D) $\frac{3e^4+1}{4}$ E) $\frac{e^4-4e^2+1}{4}$

9. $\int_{0}^{\frac{\pi}{4}} \cos 2x \cdot \sin 4x\ dx = ?$

A) $\frac{1}{4}$ B) $\frac{1}{3}$ C) $\frac{1}{2}$ D) 1 E) $\frac{5}{4}$

10. $F(x) = \int_{0}^{\sqrt{x}} e^{t^2} dt \Rightarrow F'(1) = ?$

A) $\frac{e}{4}$ B) $\frac{e}{3}$ C) $\frac{e}{2}$ D) e E) 2e

11. $F(x) = \int_{0}^{\cos x} \arccos t\ dt \Rightarrow F'\left(\frac{\pi}{2}\right) = ?$

A) $-\frac{\pi}{2}$ B) 0 C) $\frac{\pi}{6}$ D) $\frac{\pi}{4}$ E) $\frac{\pi}{2}$

12. $\int_{-5}^{5} \sqrt{25-x^2}\ dx = ?$

A) $\frac{5\pi}{2}$ B) 5π C) $\frac{15\pi}{2}$ D) 10π E) $\frac{25\pi}{2}$

YANITLAR / ANSWERS

1. B	2. A	3. C	4. C	5. C	6. B	7. B	8. D
9. B	10. C	11. A	12. E				

1. $$\int_{\frac{\pi}{3}}^{\frac{\pi}{2}} \cot x\,dx = \int_{\frac{\pi}{3}}^{\frac{\pi}{2}} \frac{\cos x}{\sin x}\,dx$$

$\sin x = u \Rightarrow \cos x\,dx = du$

$x = \frac{\pi}{3} \Rightarrow \sin\frac{\pi}{3} = \frac{\sqrt{3}}{2} \Rightarrow u = \frac{\sqrt{3}}{2}$

$x = \frac{\pi}{2} \Rightarrow \sin\frac{\pi}{2} = 1 \Rightarrow u = 1$

$$\int_{\frac{\sqrt{3}}{2}}^{1} \frac{du}{u} = \ln u \Big|_{\frac{\sqrt{3}}{2}}^{1} = \ln 1 - \ln\frac{\sqrt{3}}{2}$$

$$= 0 - \ln\frac{\sqrt{3}}{2} = -\ln\frac{\sqrt{3}}{2}$$

Yanıt / The Answer is B

---

2. $\ln x = u \Rightarrow \frac{1}{x}\,dx = du$

$x = 1 \Rightarrow \ln 1 = 0 \Rightarrow u = 0$

$x = e^2 \Rightarrow \ln e^2 = 2 \Rightarrow u = 2$

$$\int_{1}^{e^2} \frac{\ln^2 x}{x}\,dx = \int_{0}^{2} u^2\,du$$

$$= \frac{u^3}{3}\Big|_{0}^{2} = \left(\frac{8}{3} - 0\right) = \frac{8}{3}$$

Yanıt / The Answer is A

---

3. $x^3 + 3x + 5 = u \Rightarrow (3x^2 + 3)\,dx = du \;,\; (x^2 + 1)dx = \frac{du}{3}$

$x = 0 \Rightarrow x^2 + 3x + 5 = 5 \Rightarrow u = 5$

$x = 1 \Rightarrow x^2 + 3x + 5 = 9 \Rightarrow u = 9$

$$\int_{0}^{1} \frac{x^2 + 1}{x^3 + 3x + 5}\,dx = \frac{1}{3}\int_{5}^{9} \frac{du}{u}$$

$$= \frac{1}{3}\left[\ln u \Big|_{5}^{9}\right]$$

$$= \frac{1}{3}\left[\ln 9 - \ln 5\right] = \frac{1}{3}\ln\frac{9}{5}$$

Yanıt / The Answer is C

4. $1 + \sin x = u \Rightarrow \cos x\,dx = du$

$x = 0 \Rightarrow \quad 1 + \sin 0 = 1 \quad \Rightarrow u = 1$

$x = \frac{\pi}{2} \Rightarrow 1 + \sin\frac{\pi}{2} = 2 \Rightarrow u = 2$

$$\int_{0}^{\frac{\pi}{2}} \frac{\cos x\,dx}{(1+\sin x)^3}\,dx = \int_{1}^{2} \frac{du}{u^3}$$

$$= \frac{u^{-2}}{-2}\Big|_{1}^{2}$$

$$= \frac{-1}{2u^2}\Big|_{1}^{2} = \left(-\frac{1}{8} - \left(-\frac{1}{2}\right)\right) = \frac{3}{8}$$

Yanıt / The Answer is C

---

5. $$\int_{0}^{2} \frac{dx}{4 + x^2} = \frac{1}{4}\int_{0}^{2} \frac{dx}{1 + (\frac{x}{2})^2} \;,\quad \frac{x}{2} = u \Rightarrow \frac{1}{2}dx = du$$

$x = 0 \Rightarrow \frac{x}{2} = 0 \Rightarrow u = 0$

$x = 2 \Rightarrow \frac{x}{2} = 1 \Rightarrow u = 1$

$$\frac{1}{4}\int_{0}^{2} \frac{dx}{1 + (\frac{x}{2})^2} = \frac{1}{4}\int_{0}^{1} \frac{2\,du}{1 + u^2}$$

$$= \frac{1}{4}\cdot 2(\arctan u)\Big|_{0}^{1}$$

$$= \frac{1}{2}(\arctan 1 - \arctan 0) = \frac{1}{2}\left(\frac{\pi}{4} - 0\right) = \frac{\pi}{8}$$

Yanıt / The Answer is C

---

6. $$\frac{1}{x^2 - 4} = \frac{A}{x-2} + \frac{B}{x+2}$$

$$\left.\begin{aligned} A + B &= 0 \\ 2A - 2B &= 1 \end{aligned}\right\} \Rightarrow A = \frac{1}{4},\quad B = -\frac{1}{4}$$

$$\int_{0}^{\pi} \frac{dx}{x^2 - 4} = \int_{0}^{\pi} \left(\frac{\frac{1}{4}}{x-2} - \frac{\frac{1}{4}}{x+2}\right)dx$$

$$= \frac{1}{4}\cdot\int_{0}^{\pi} \left(\frac{1}{x-2} - \frac{1}{x+2}\right)dx$$

$$= \frac{1}{4}\cdot(\ln|x-2| - \ln|x+2|)\Big|_{0}^{\pi} = \frac{1}{4}\ln\left|\frac{\pi - 2}{\pi + 2}\right|$$

Yanıt / The Answer is B

7. $$\int_0^{\frac{\pi}{2}} \cos^2 x\,dx = \int_0^{\frac{\pi}{2}} \frac{\cos 2x+1}{2}\,dx$$

$$= \frac{1}{2}\left[\int_0^{\frac{\pi}{2}} \cos 2x\,dx + \int_0^{\frac{\pi}{2}} dx\right]$$

$$= \frac{1}{2}\left[\frac{1}{2}\sin 2x\Big|_0^{\frac{\pi}{2}} + x\Big|_0^{\frac{\pi}{2}}\right]$$

$$= \frac{1}{2}\left[\frac{1}{2}(\sin\pi-\sin 0)+\left(\frac{\pi}{2}-0\right)\right]$$

$$= \frac{1}{2}\cdot\left(0+\frac{\pi}{2}\right)=\frac{\pi}{4}$$

Yanıt / The Answer is B

8.

$\ln x = u \quad , \quad x\,dx = dv \quad , \quad \frac{1}{x}dx = du \quad , \quad \frac{x^2}{2} = v$

$$\int_1^{e^2} x\ln x\,dx = \ln x\cdot\frac{x^2}{2} - \frac{1}{2}\int_1^{e^2} x^2\cdot\frac{1}{x}\,dx$$

$$= \ln x\cdot\frac{x^2}{2} - \frac{x^2}{4}\Big|_1^{e^2}$$

$$= \left(\ln e^2\cdot\frac{e^4}{2} - \frac{e^4}{4}\right) - \left(\ln 1\cdot\frac{1}{2} - \frac{1}{4}\right)$$

$$= \left(2\cdot\frac{e^4}{2} - \frac{e^4}{4}\right) + \frac{1}{4}$$

$$= \frac{3e^4}{4} + \frac{1}{4} = \frac{3e^4+1}{4}$$

Yanıt / The Answer is D

---

9. $$\int_0^{\frac{\pi}{4}} \cos 2x\cdot\sin 4x\,dx = \int_0^{\frac{\pi}{4}} \cos 2x\cdot 2\cos 2x\cdot\sin 2x\,dx$$

$$= \int_0^{\frac{\pi}{4}} (\cos 2x)^2\cdot 2\sin 2x\,dx$$

$\cos 2x = u \Rightarrow -2\sin 2x\,dx = du$

$x = 0 \Rightarrow \cos 2x = 1 \Rightarrow u = 1$

$x = \frac{\pi}{4} \Rightarrow \cos 2x = 0 \Rightarrow u = 0$

$$\int_0^{\frac{\pi}{4}} (\cos 2x)^2\cdot 2\sin 2x\,dx = -\int_1^0 u^2\,du$$

$$= -\left[\frac{u^3}{3}\Big|_1^0\right] = -\left(0-\frac{1}{3}\right) = \frac{1}{3}$$

Yanıt / The Answer is B

---

10. $$F(x) = \int_0^{\sqrt{x}} e^{t^2}\,dt \Rightarrow F'(x) = (\sqrt{x})'\cdot e^{(\sqrt{x})^2} = \frac{1}{2\sqrt{x}}e^x$$

$$\Rightarrow F'(1) = \frac{1}{2\sqrt{1}}e^1 = \frac{e}{2}$$

Yanıt / The Answer is C

---

11. $$F(x) = \int_0^{\cos x} \arccos t\,dt$$

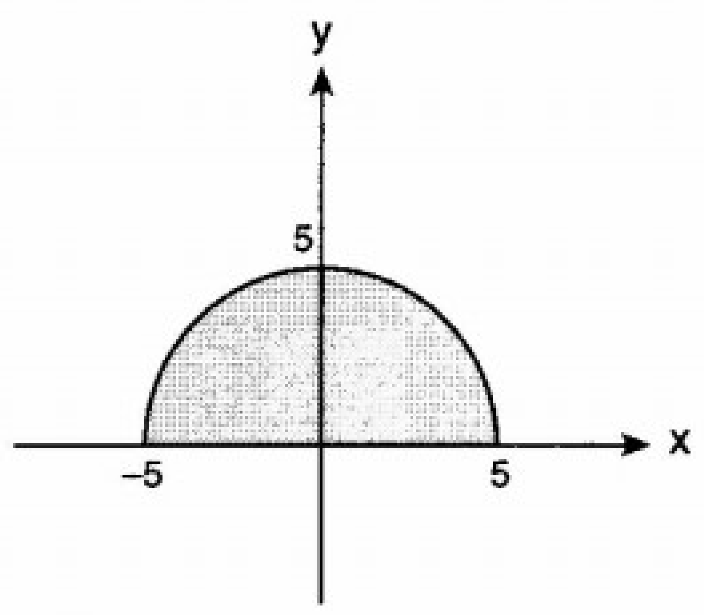
$$\Rightarrow F'(x) = (\cos x)'\cdot(\arccos(\cos x)) = -\sin x\cdot x$$

$$F'\left(\frac{\pi}{2}\right) = -\sin\frac{\pi}{2}\cdot\frac{\pi}{2} = \frac{-\pi}{2}$$

Yanıt / The Answer is A

12.

$$\left.\begin{aligned} y &= \sqrt{25-x^2} \\ y^2 &= 25-x^2 \\ x^2+y^2 &= 25 \end{aligned}\right\} \Rightarrow$$



$$\Rightarrow \int_{-5}^{5} \sqrt{25-x^2}\,dx = \frac{\pi r^2}{2} = \frac{\pi 5^2}{2} = \frac{25\pi}{2}$$

Yanıt / The Answer is E

1. **Taralı alan /**

The shaded area **= ? br^2 / u^2**

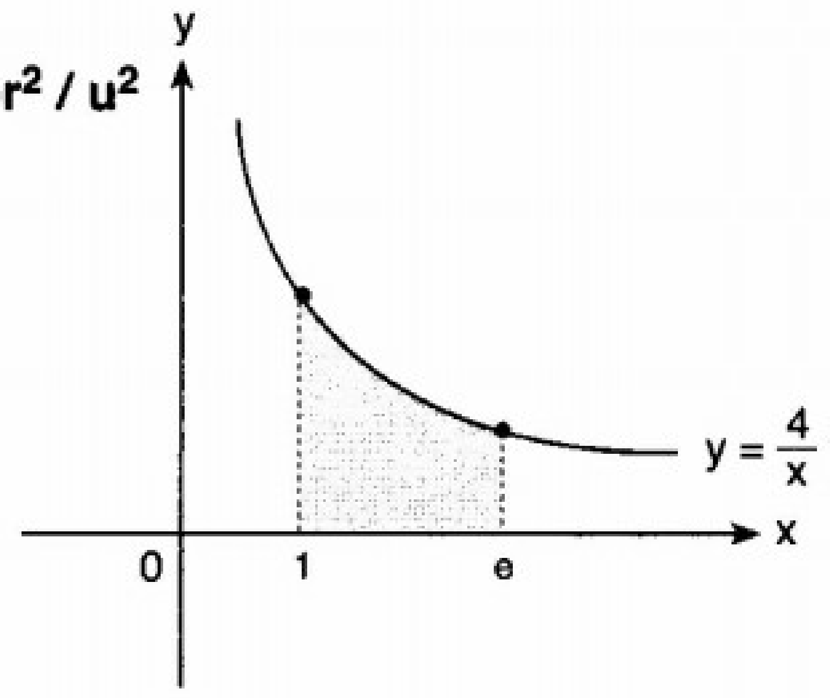
A) 2

B) 3

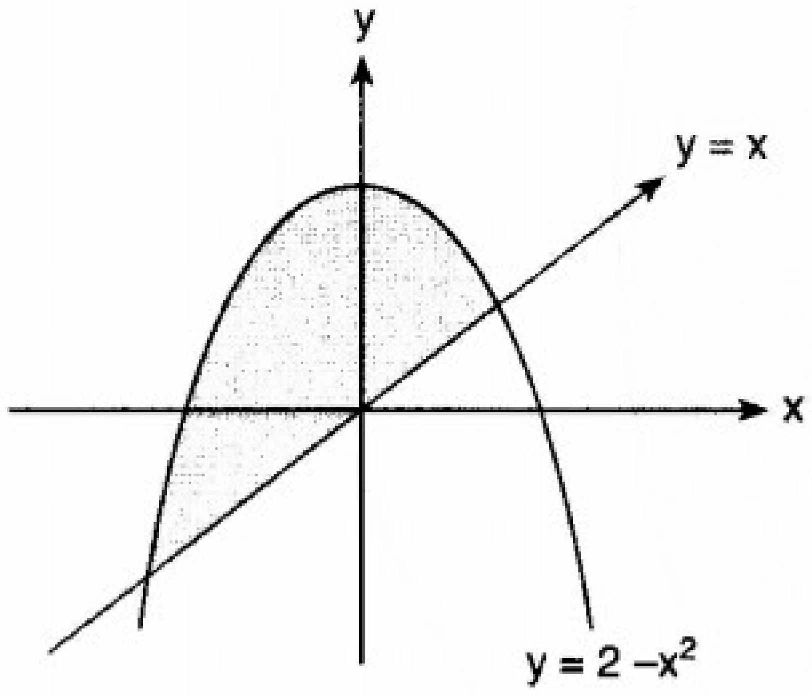
C) 4

D) 6

E) 7



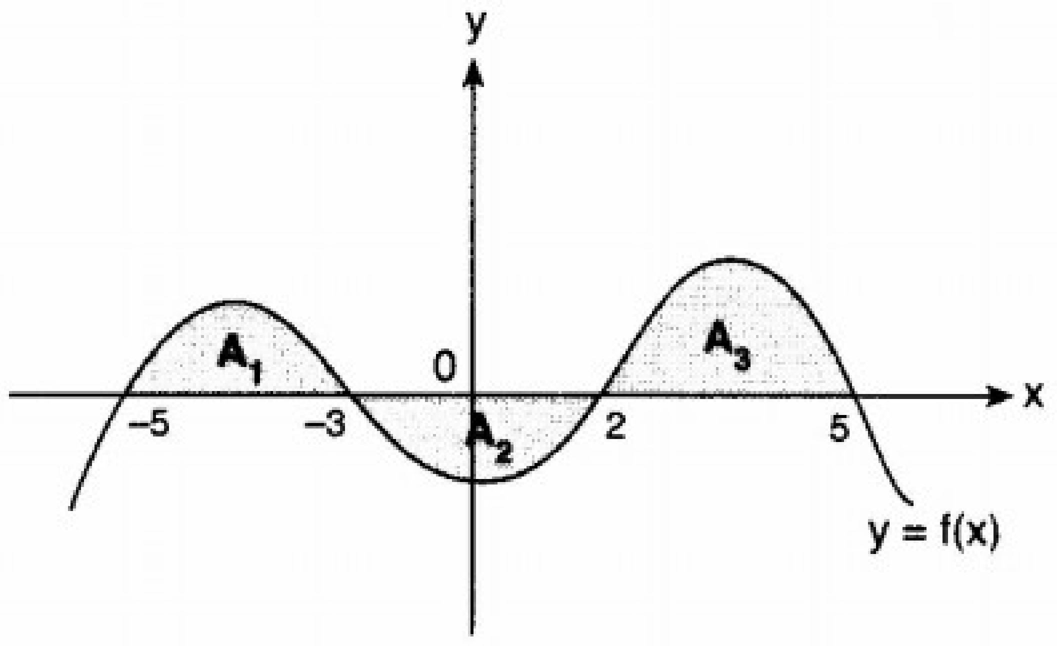
2.



Taralı alan / ***The shaded area*** **= ? br^2 / u^2**

A) $\frac{5}{2}$ B) 3 C) $\frac{7}{2}$ D) 4 E) $\frac{9}{2}$

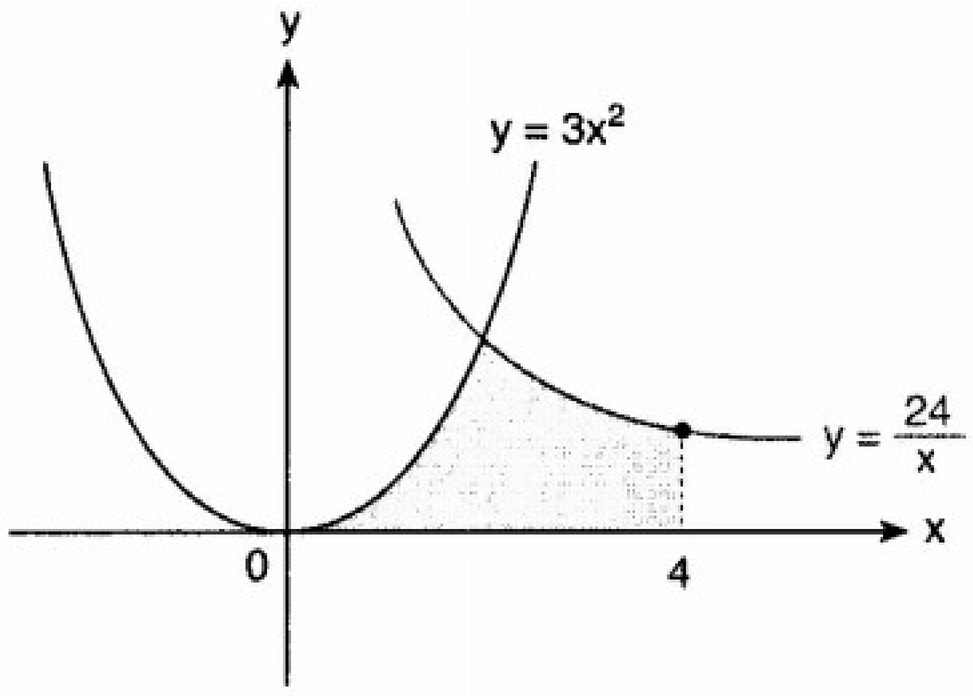
3.



$\int_{-5}^{5} f(x)\,dx = 18$, $A_1 = 8$ br²/u², $A_2 = 5$ br²/u² $\Rightarrow$ $\mathbf{A_3 = ?}$

A) 3 B) 6 C) 9 D) 12 E) 15

4.

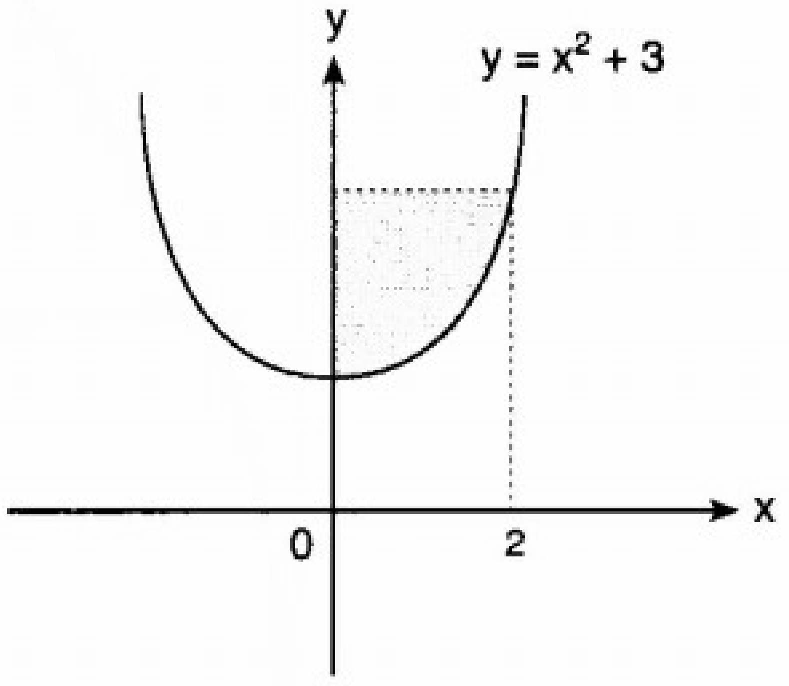


Taralı alan / ***The shaded area*** **= ? br^2 / u^2**

A) 8 + 18ln2 B) 16 + 36ln2 C) 8 + 16ln2

D) 12 + 24ln2 E) 8 + 24ln2

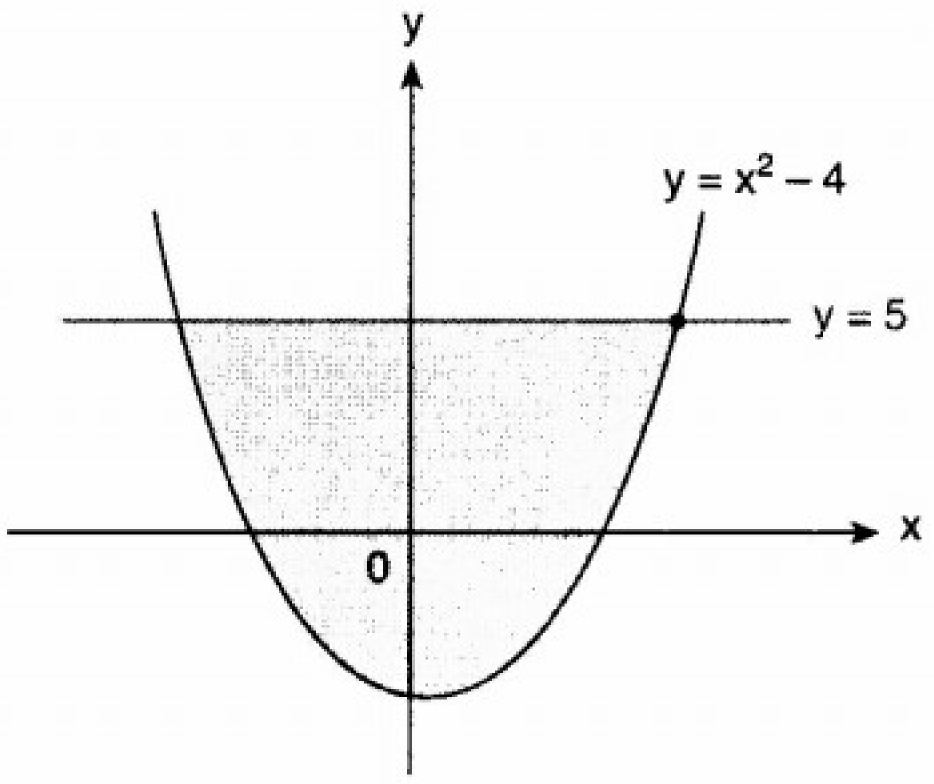
5.



Taralı alan / ***The shaded area*** **= ? br^2 / u^2**

A) $\frac{16}{3}$ B) $\frac{17}{3}$ C) $\frac{22}{3}$ D) $\frac{26}{3}$ E) $\frac{28}{3}$

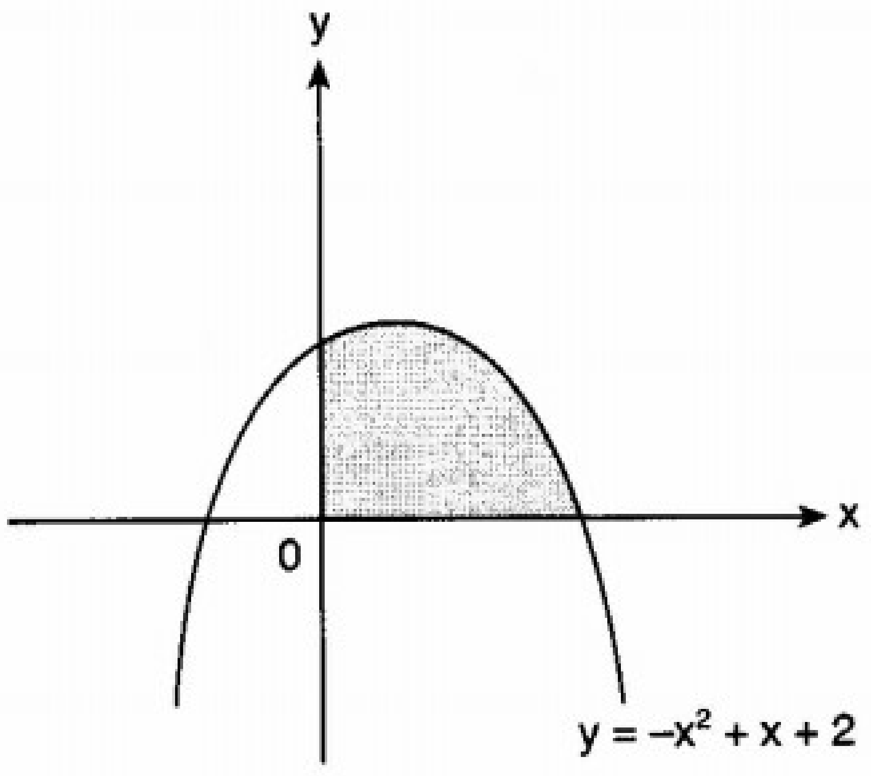
6.



Taralı alan / ***The shaded area*** **= ? br^2 / u^2**

A) 36 B) 40 C) 45 D) 48 E) 50

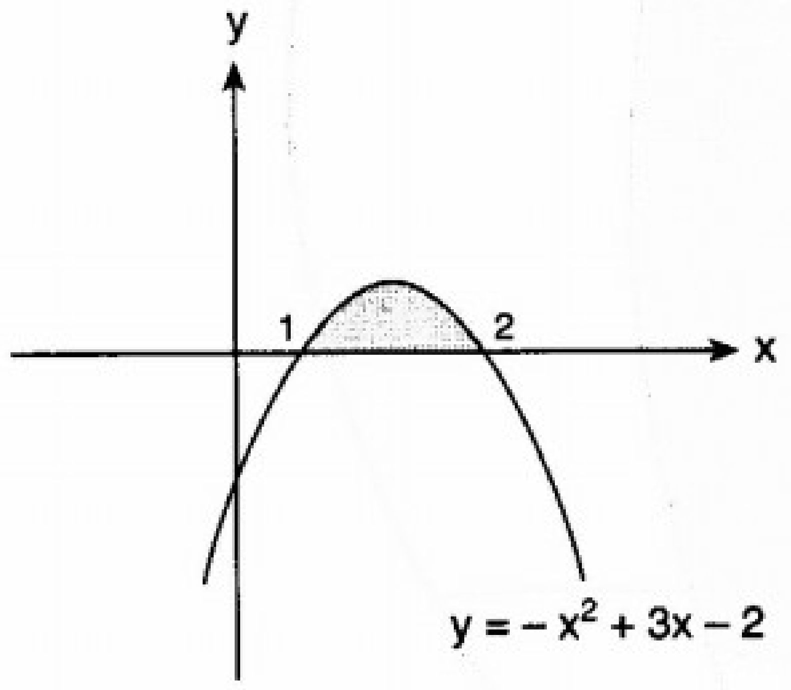
7.



Taralı alan / *The shaded area* = ? br^2 / u^2

A) $\frac{8}{3}$ B) $\frac{10}{3}$ C) $\frac{11}{3}$ D) $\frac{13}{3}$ E) $\frac{14}{3}$

8.


y
1
2
x
$y = -x^2 + 3x - 2$

Taralı alan

***/ The shaded area* = ? br^2 / u^2**

A) $\frac{1}{2}$ B) $\frac{1}{3}$ C) $\frac{1}{4}$ D) $\frac{1}{6}$ E) $\frac{1}{5}$

9. **Taralı alan /**

***The shaded area* = ? br^2 / u^2**

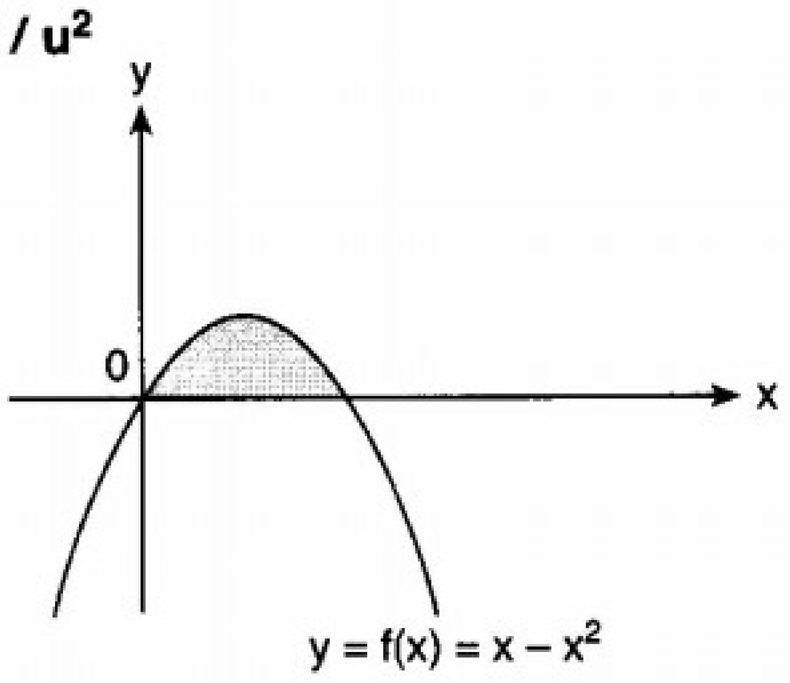
A) 4

B) 2

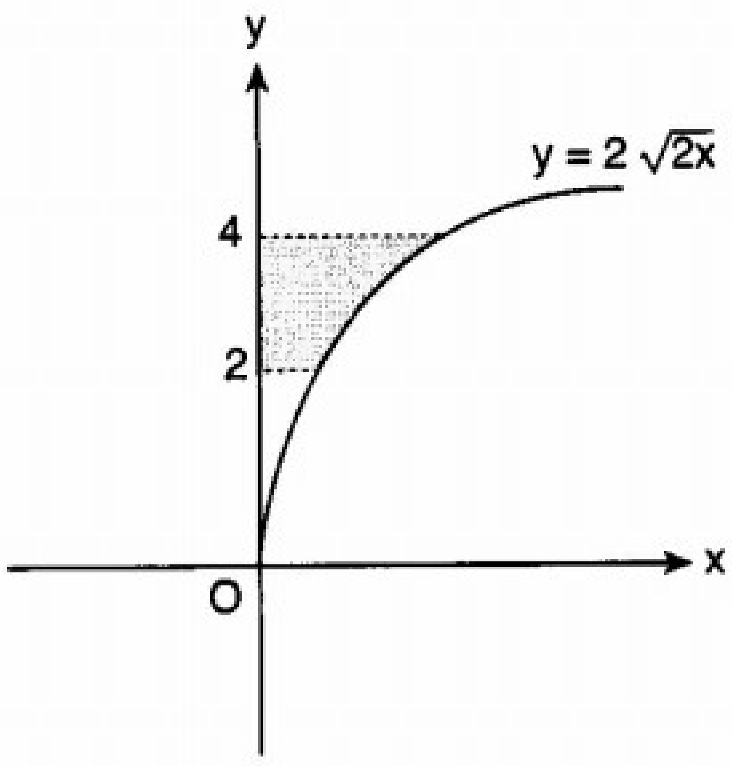
C) $\frac{1}{2}$

D) $\frac{1}{4}$

E) $\frac{1}{6}$



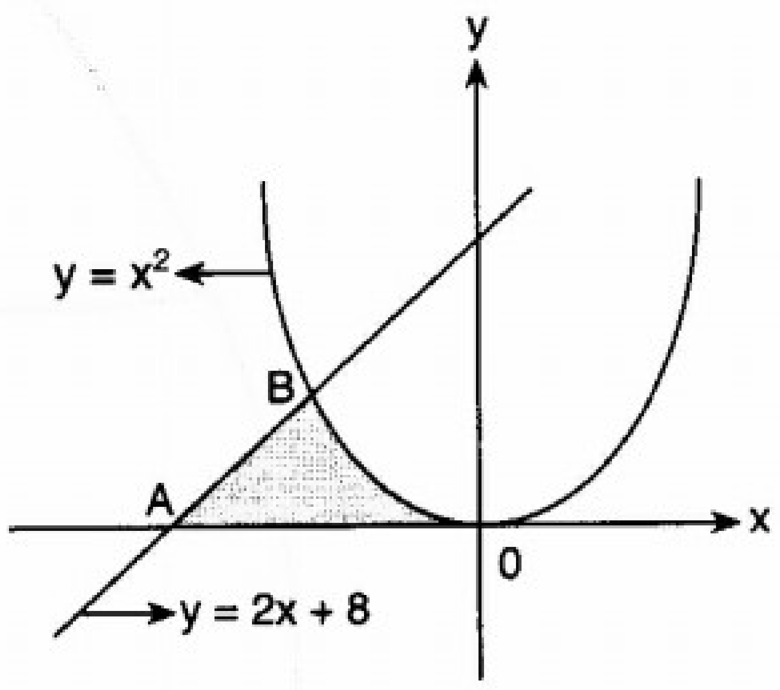
10.


y
$y = 2\sqrt{2x}$
4
2
O
x

Taralı alan / *The shaded area* = ? br^2 / u^2

A) $\frac{7}{3}$ B) $\frac{10}{3}$ C) $\frac{14}{3}$ D) $\frac{17}{3}$ E) $\frac{22}{3}$

11.


y
$y = x^2$
B
A
x
0
$y = 2x + 8$

Taralı alan / *The shaded area* = ? br^2 / u^2

A) $\frac{10}{3}$ B) $\frac{16}{3}$ C) $\frac{20}{3}$ D) $\frac{31}{3}$ E) $\frac{47}{3}$

12. $\displaystyle\int_{-1}^{2} \frac{f'(x)}{f(x)}\,dx = ?$

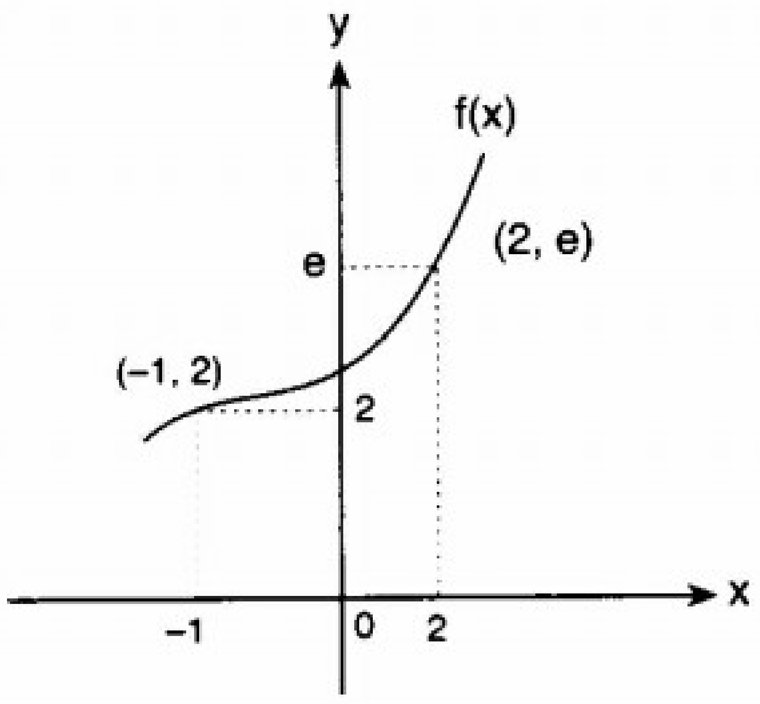
A) ln2 – 1

B) 1 – ln2

C) 1

D) 0

E) ln2


y
f(x)
(2, e)
e
(–1, 2)
2
–1
0
2
x

YANITLAR / ANSWERS

1. C	2. E	3. E	4. E	5. A	6. A	7. B	8. D
9. E	10. A	11. C	12. B				

1. $f(x)=\frac{4}{x} \Rightarrow TA/SA=\int_1^e \frac{4}{x}\,dx$

$TA/SA=4\cdot \ln x\Big|_1^e=4\cdot(\ln e-\ln 1)=4\ br^2/u^2$

Yanıt / The Answer is C

2.

$-x^2+2x+3=x+1$

$x^2-x-2=0$

$x_1=2,\ \ x_2=-1$

$\Rightarrow TA/SA=\int_{-1}^{2}(-x^2+2x+3)-(x+1)\,dx$

$=\int_{-1}^{2}(-x^2+x+2)\,dx$

$=\left(-\frac{x^3}{3}+\frac{x^2}{2}+2x\Big|_{-1}^{2}\right)=\frac{9}{2}\ br^2/u^2$

Yanıt / The Answer is E

---

3. $A_1=8\ br^2/u^2 \Rightarrow \int_{-5}^{-3} f(x)=8$

$A_2=5\ br^2/u^2 \Rightarrow \int_{-3}^{2} f(x)=-5$

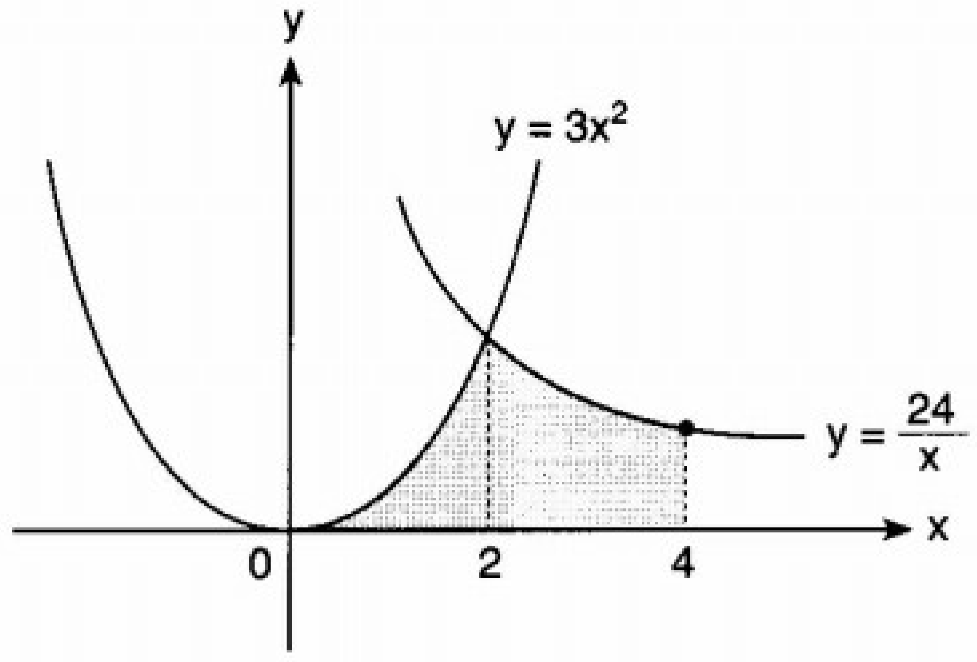
$\int_{-5}^{5} f(x)\,dx=\int_{-5}^{-3} f(x)\,dx+\int_{-3}^{2} f(x)\,dx+\int_{2}^{5} f(x)\,dx=18$

$18=8-5+A_3$

$A_3=15\ br^2/u^2$

Yanıt / The Answer is E

4.



$3x^2=\frac{24}{x} \Rightarrow x=2$

$TA/SA=\int_0^2 3x^2\,dx+\int_2^4 \frac{24}{x}\,dx=x^3\Big|_0^2+24\ln x\Big|_2^4=8+24\ln 2$

Yanıt / The Answer is E

---

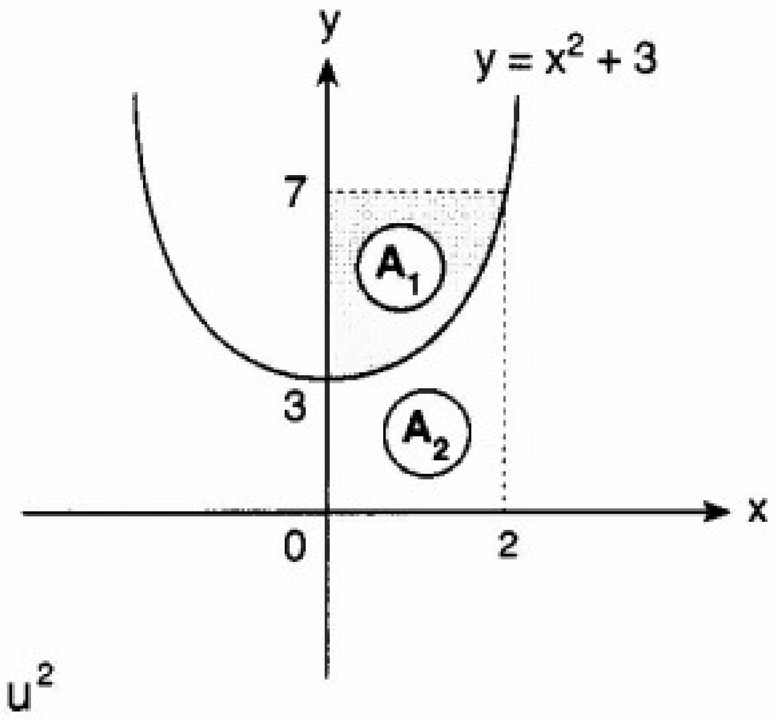
5. $A_1=(A_1+A_2)-A_2$

$=2\cdot 7-\int_0^2 (x^2+3)\,dx$

$=14-\left(\frac{x^3}{3}+3x\Big|_0^2\right)$

$=14-\left(\frac{8}{3}+6\right)$

$=14-\frac{26}{3}=\frac{16}{3}\ br^2/u^2$



Yanıt / The Answer is A

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6. $TA/SA=\int_{-3}^{3}\left(5-(x^2-4)\right)dx$

$=\int_{-3}^{3}\left(-x^2+9\right)dx$

$=\frac{-x^3}{3}+9x\Big|_{-3}^{3}$

$=(-9+27)-(9-27)$

$=18+18=36\ br^2/u^2$

Yanıt / The Answer is A

7 $-x^2+x+2=0 \Rightarrow x_1=2 \ , x_2=-1$

$$TA/SA=\int_0^2(-x^2+x+2)\,dx$$

$$=-\frac{x^3}{3}+\frac{x^2}{2}+2x\Big|_0^2$$

$$=\left(-\frac{8}{3}+\frac{4}{2}+4\right)-0$$

$$=\frac{10}{3}\ br^2/u^2$$

Yanıt / The Answer is B

8. $S=\int_1^2(-x^2+3x-2)\,dx$

$$=\left(-\frac{x^3}{3}+3\cdot\frac{x^2}{2}-2x\right)\Big|_1^2$$

$$=\left(-\frac{2^3}{3}+3\cdot\frac{2^2}{2}-2\cdot2\right)-\left(-\frac{1^3}{3}+3\cdot\frac{1}{2}-2\cdot1\right)$$

$$=\left(-\frac{8}{3}+6-4\right)-\left(-\frac{1}{3}+\frac{3}{2}-2\right)$$

$$=-\frac{8}{3}+2+\frac{1}{3}+\frac{1}{2}$$

$$=-\frac{7}{3}+\frac{5}{2}=\frac{1}{6}\ br^2/u^2$$

Yanıt / The Answer is D

9. $x^2-x=0$

$x\cdot(x-1)=0$

$x=0$ veya (or) $x=1$

$$TA/SA=\int_0^1(x-x^2)\,dx$$

$$=\left(\frac{x^2}{2}-\frac{x^3}{3}\right)\Big|_0^1$$

$$=\frac{1}{2}-\frac{1}{3}=\frac{1}{6}\ br^2/u^2$$

Yanıt / The Answer is E

10. $y=2\sqrt{2x} \ \Rightarrow y^2=8x$

$$x=\frac{y^2}{8}$$

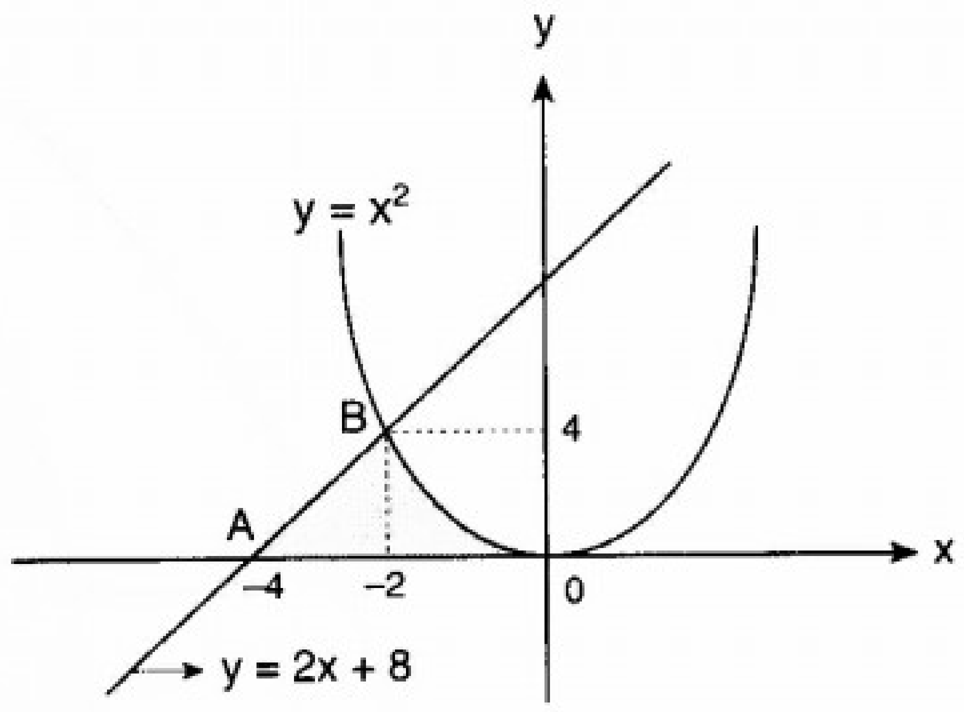
$$A=\int_2^4|f(y)|\,dy$$

$$A=\int_2^4\left|\frac{y^2}{8}\right|dy=\frac{y^3}{24}\Big|_2^4=\frac{64}{24}-\frac{8}{24}$$

$$=\frac{56}{24}=\frac{7}{3}\ br^2/u^2$$

Yanıt / The Answer is A

11.



$$TA/SA=\int_{-4}^{-2}(2x+8)\,dx+\int_{-2}^{0}x^2\,dx$$

$$=x^2+8x\Big|_{-4}^{-2}+\frac{x^3}{3}\Big|_{-2}^{0}$$

$$=(-12-(-16))+(0-(-\frac{8}{3}))=4+\frac{8}{3}=\frac{20}{3}\ br^2/u^2$$

Yanıt / The Answer is C

12. $f(x)=u \Rightarrow f'(x)\,dx=du$

$x=-1 \Rightarrow f(-1)=2$

$x=2 \Rightarrow f(2)=e$

$$\int_{-1}^{2}\frac{f'(x)}{f(x)}\,dx=\int_2^e\frac{du}{u}$$

$$=\ln u\Big|_2^e$$

$$=\ln e-\ln 2$$

$$=1-\ln 2$$

Yanıt / The Answer is B

1. $\int_{0}^{1} \frac{2x^2+3x}{x}\,dx = ?$

Yanıt / The Answer is: **4**

2. $\int_{1}^{3} \left(\frac{1}{x^2}-\frac{1}{x^3}\right) dx = ?$

Yanıt / The Answer is: $\frac{2}{9}$

3. $\int_{0}^{\frac{\pi}{2}} (\sin x - \cos x)\,dx = ?$

Yanıt / The Answer is: **0**

4. $\int_{1}^{e^2} \frac{3}{x}\,dx = ?$

Yanıt / The Answer is: **6**

5. $\int_{\ln 2}^{\ln 8} (e^{2x} - 2e^{x})\,dx = ?$

Yanıt / The Answer is: **18**

6. $\int_{0}^{\sqrt{3}} \frac{1}{1+x^2}\,dx = ?$

Yanıt / The Answer is: $\frac{\pi}{3}$

7. $\int_{-a}^{a} (x^3+4)\,dx = 24 \Rightarrow \mathbf{a = ?}$

Yanıt / The Answer is: **3**

8. $\int_{2}^{5} \frac{3x^2+2}{x^3+2x}\,dx = ?$

Yanıt / The Answer is: $\ln\frac{45}{4}$

9. $\int_{3}^{5} \frac{e^{\ln x}}{x}\,dx = ?$

Yanıt / The Answer is: **2**

10. $\int_{\frac{\pi}{6}}^{0} \tan x\,dx = ?$

Yanıt / The Answer is: $\ln\frac{\sqrt{3}}{2}$

11. $\int_{4}^{1} f(x)\,dx = -6 \Rightarrow \int_{2}^{5} f(6-x)\,dx = ?$

Yanıt / The Answer is: **6**

12. $\int_{0}^{1} 2xe^{x^2}\,dx = ?$

Yanıt / The Answer is: **e – 1**

13. $\int_{-2}^{2} |x+2|\, dx = ?$

Yanıt / The Answer is: **8**

14. $\int_{-3}^{2} \left|x^2-2x-3\right| dx = ?$

Yanıt / The Answer is: $\frac{59}{3}$

15. $\int_{0}^{\pi} (|\cos x|-|\sin x|)\, dx = ?$

Yanıt / The Answer is: **0**

16. $\int_{-1}^{1} \frac{|x|}{x}\, dx = ?$

Yanıt / The Answer is: **0**

17. $\int_{0}^{\frac{\pi}{4}} (\cos^4 x-\sin^4 x)\, dx = ?$

Yanıt / The Answer is: $\frac{1}{2}$

18. $\int_{0}^{e-1} \frac{x}{x+1}\, dx = ?$

Yanıt / The Answer is: **e – 2**

19. $\int_0^4 \sqrt{16-x^2}\,dx = ?$

Yanıt / The Answer is: **4π**

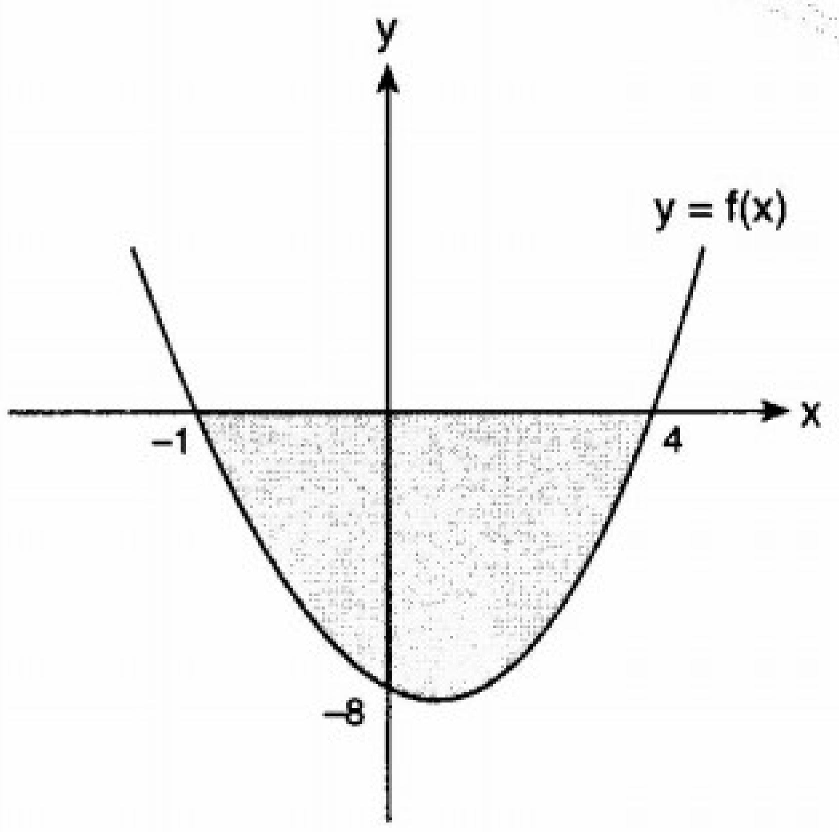
---

20. $\frac{d}{dx}\left[\int_1^4 (x^2+x)\,dx\right] = ?$

Yanıt / The Answer is: **0**

---

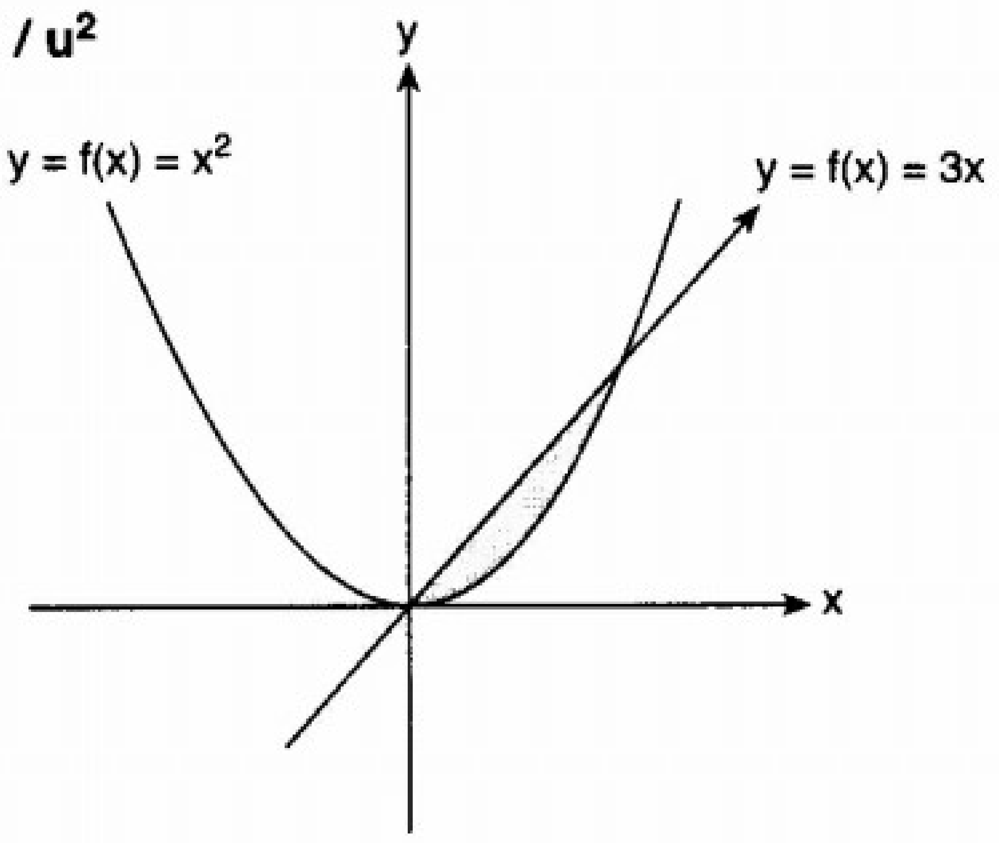
21. **TA / SA = ? br^2 / u^2**



Yanıt / The Answer is: $\frac{125}{3}$

---

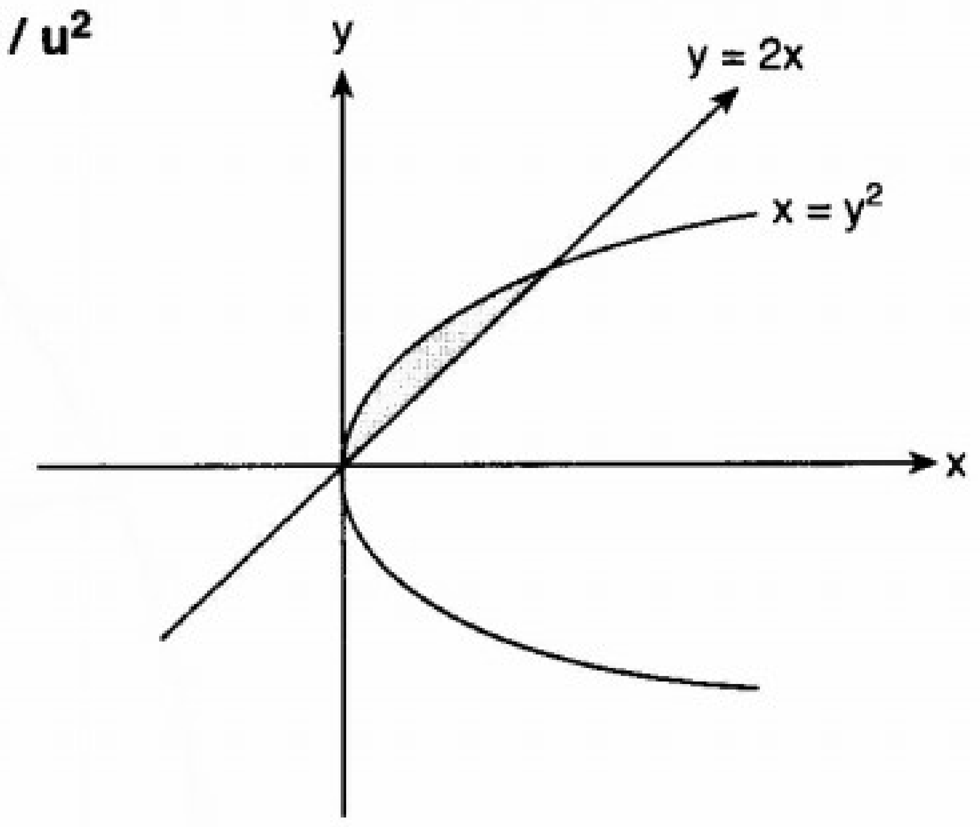
22. **TA / SA = ? br^2 / u^2**


y
y = f(x) = x²
y = f(x) = 3x
x

Yanıt / The Answer is: $\frac{9}{2}$

---

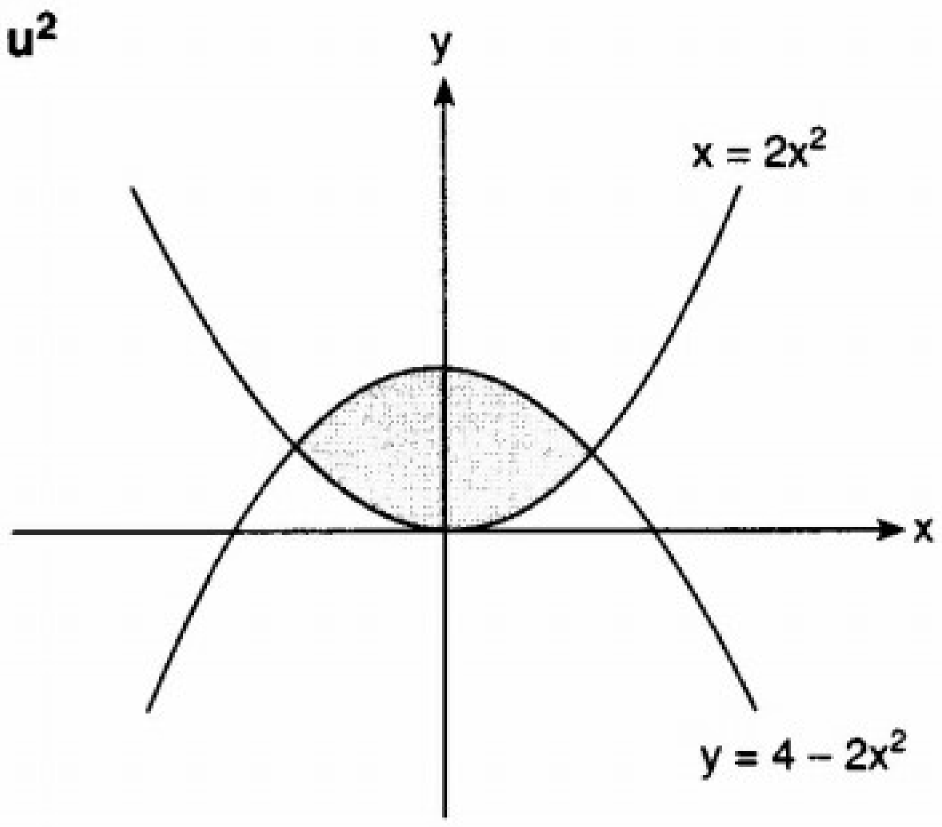
23. **TA / SA = ? br^2 / u^2**



Yanıt / The Answer is: $\frac{1}{48}$

---

24. **TA / SA = ? br^2 / u^2**


y
x = 2x²
x
y = 4 – 2x²

Yanıt / The Answer is: $\frac{16}{3}$

13. $\int_{-2}^{2} |x+2|\, dx = ?$

Yanıt / The Answer is: **8**

14. $\int_{-3}^{2} \left| x^2 - 2x - 3 \right| dx = ?$

Yanıt / The Answer is: $\frac{59}{3}$

15. $\int_{0}^{\pi} (|\cos x| - |\sin x|)\, dx = ?$

Yanıt / The Answer is: **0**

16. $\int_{-1}^{1} \frac{|x|}{x}\, dx = ?$

Yanıt / The Answer is: **0**

17. $\int_{0}^{\frac{\pi}{4}} (\cos^4 x - \sin^4 x)\, dx = ?$

Yanıt / The Answer is: $\frac{1}{2}$

18. $\int_{0}^{e-1} \frac{x}{x+1}\, dx = ?$

Yanıt / The Answer is: **$e - 2$**

1. $\int_1^2 \frac{2x^3+1}{x^2}\,dx = ?$

A) 3

B) $\frac{7}{2}$

C) 4

D) $\frac{9}{2}$

E) 5

2. $\int_1^2 \frac{dx}{3x+1} = ?$

A) $\frac{1}{2}\ln 14$

B) $\frac{1}{4}\ln\frac{7}{3}$

C) $\frac{1}{4}\ln\frac{3}{7}$

D) $\frac{1}{3}\ln\frac{4}{7}$

E) $\frac{1}{3}\ln\frac{7}{4}$

3. $\int_0^1 \left(x^2+e^x\right) dx = ?$

A) $e+\frac{4}{3}$

B) $e-\frac{4}{3}$

C) $e-\frac{2}{3}$

D) $e+\frac{2}{3}$

E) $e-\frac{3}{4}$

4. $b-a=5,\ \int_a^b (2x+1)\,dx = 25 \Rightarrow b = ?$

A) $\frac{5}{2}$

B) 3

C) $\frac{7}{2}$

D) 4

E) $\frac{9}{2}$

5. $\int_0^{\frac{\pi}{4}} (\cos x+\sin x)\,dx = ?$

A) 1

B) $\frac{\sqrt{2}}{2}$

C) $\sqrt{2}$

D) $2\sqrt{2}$

E) 4

6. $\int_0^1 \left(\frac{1-\sqrt{x}}{\sqrt{x}}\right) dx = ?$

A) 1

B) 2

C) 3

D) 4

E) 5

7. $\int_{-1}^{2} (6x^2 - 4x)\,dx = ?$

A) 4

B) 6

C) 8

D) 10

E) 12

8. $\int_{0}^{3} |x - 1|\,dx = ?$

A) 1

B) $\frac{3}{2}$

C) 2

D) $\frac{5}{2}$

E) 3

9. $\frac{d}{dx}\left(\int_{-2}^{3} (x^2 + 5x - 2)\,dx\right) = ?$

A) $-\frac{93}{6}$

B) $-\frac{85}{6}$

C) 0

D) $\frac{45}{6}$

E) $\frac{85}{6}$

10. $\int_{-2}^{4} |x - 3|\,dx = ?$

A) 12

B) 13

C) 14

D) 15

E) 16

11. $\int_{\frac{\pi}{4}}^{\pi} \sin 2x\,dx = ?$

A) $-\frac{1}{2}$

B) $-\frac{1}{3}$

C) $-\frac{1}{4}$

D) $-\frac{1}{5}$

E) $-\frac{1}{6}$

12. $\int_{-2}^{2} \frac{x^3}{1+x^4}\,dx = ?$

A) –8

B) –6

C) –4

D) –2

E) 0

YANITLAR / ANSWERS

1. B	2. E	3. C	4. E	5. A	6. A	7. E	8. D
9. C	10. B	11. A	12. E				

1. $\int_0^{10} 2^x \, dx = ?$

A) $\frac{2^{10}}{\ln 2}$

B) $\frac{2^{10}+1}{\ln 2}$

C) $\frac{2^{10}-1}{\ln 2}$

D) 2^{10}

E) $2^{10}-1$

2. $\int_0^{8} \sqrt[3]{x^2} \, dx = ?$

A) $\frac{91}{5}$

B) $\frac{92}{5}$

C) $\frac{93}{5}$

D) $\frac{94}{5}$

E) $\frac{96}{5}$

3. $\int_0^{1} \frac{3x \, dx}{x+1} = ?$

A) $\ln \frac{e^3}{2}$

B) $\ln \frac{e^3}{8}$

C) $\ln \frac{e}{2}$

D) $\ln \frac{e}{8}$

E) $\ln 8e$

4. $\int_0^{\frac{\pi}{2}} \sin^2 x \cdot \cos x \, dx = ?$

A) $\frac{1}{3}$

B) $\frac{1}{6}$

C) 0

D) $-\frac{1}{3}$

E) $-\frac{1}{6}$

5. $\int_{-2}^{3} \left| x^2 - 2x \right| dx = ?$

A) 8

B) $\frac{25}{3}$

C) $\frac{26}{3}$

D) 9

E) $\frac{28}{3}$

6. $\int_0^{\frac{3}{2}} \frac{dx}{9+4x^2} = ?$

A) $\frac{\pi}{6}$

B) $\frac{\pi}{9}$

C) $\frac{\pi}{12}$

D) $\frac{\pi}{24}$

E) $\frac{\pi}{30}$

7. $\displaystyle\int_{\frac{\pi}{6}}^{\frac{\pi}{4}} \sqrt{1-\cos 2x}\, dx = ?$

A) $\dfrac{\sqrt{6}+2}{2}$

B) $\dfrac{\sqrt{6}-1}{4}$

C) $\dfrac{\sqrt{6}+1}{2}$

D) $\dfrac{\sqrt{6}-1}{2}$

E) $\dfrac{\sqrt{6}-2}{2}$

8. $\displaystyle\int_{0}^{\frac{\pi}{2}} x \cdot \cos x\, dx = ?$

A) $\pi-1$

B) $\dfrac{\pi}{2}-1$

C) $\dfrac{\pi}{2}-2$

D) $\pi-2$

E) $\dfrac{\pi}{3}-1$

9. $\displaystyle\int_{0}^{\frac{\pi}{4}} \sqrt{1-\cos 2x}\, dx = ?$

A) $\sqrt{2}+1$

B) $\dfrac{\sqrt{2}}{2}+1$

C) $\sqrt{2}-1$

D) $\dfrac{\sqrt{2}}{2}-1$

E) $2\sqrt{2}$

10. $\displaystyle F(x) = \int_{0}^{2x} \sin\left(\frac{\pi}{4}t\right) dt \Rightarrow F'(1) = ?$

A) 1

B) $\dfrac{3}{2}$

C) 2

D) 3

E) $\dfrac{7}{2}$

11. $\displaystyle\int_{0}^{2} \left(\sqrt{8-x^2}-x\right) dx = ?$

A) $\pi-1$

B) π

C) $\pi+1$

D) $\pi+\dfrac{3}{2}$

E) $\pi+\dfrac{5}{2}$

12. $\displaystyle\int_{0}^{\frac{\pi}{3}} \frac{\sin^3 x}{\cos^2 x}\, dx = ?$

A) $\dfrac{3}{2}$

B) 1

C) $\dfrac{3}{4}$

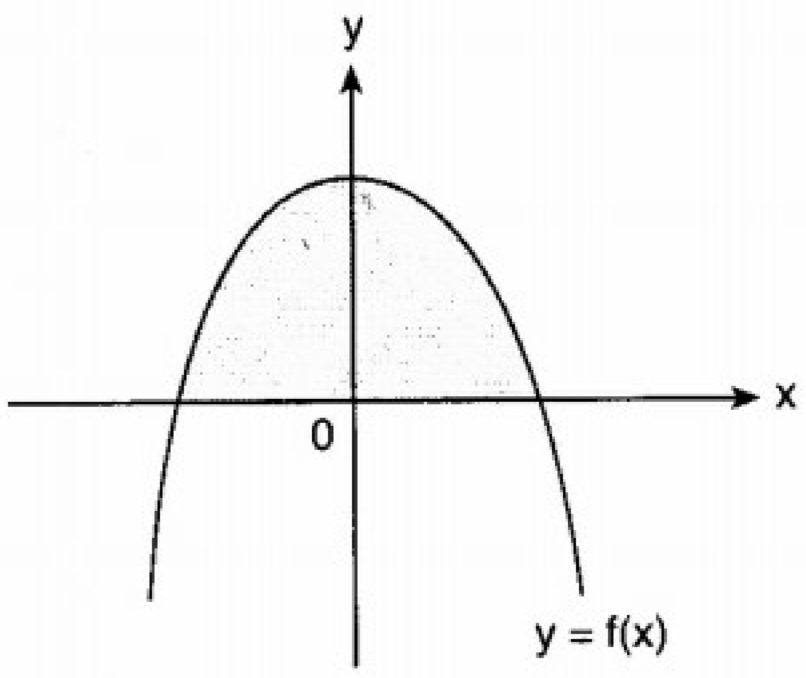
D) $\dfrac{1}{2}$

E) $\dfrac{1}{4}$

YANITLAR / ANSWERS

1. C	2. E	3. B	4. A	5. E	6. D	7. E	8. B
9. C	10. C	11. B	12. D				

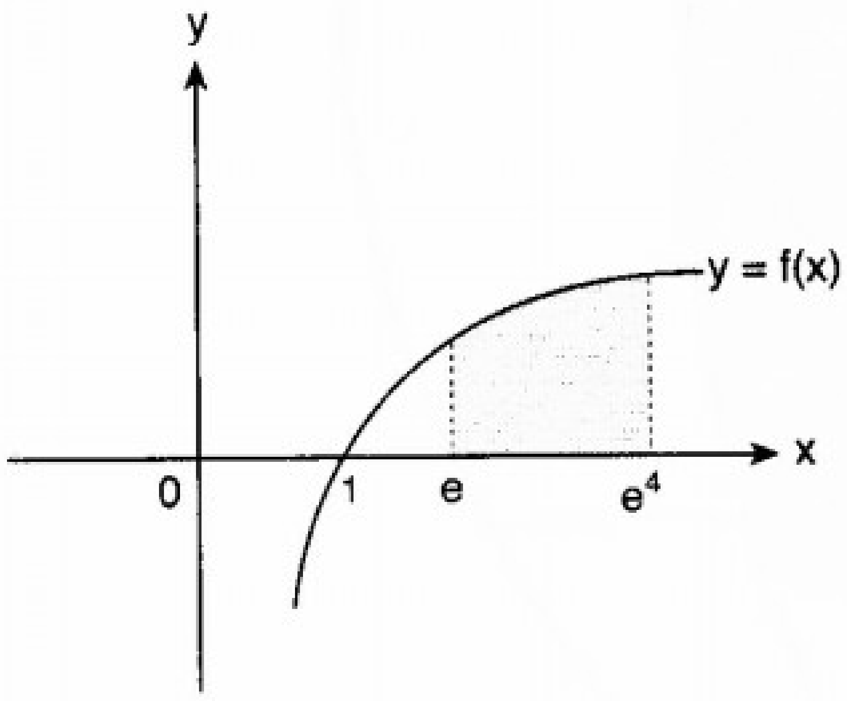
1.



$f(x) = -x^2 + 9 \Rightarrow$ **Taralı alan / *The shaded area* = ? br^2 / u^2**

A) 24
B) 28
C) 32
D) 36
E) 40

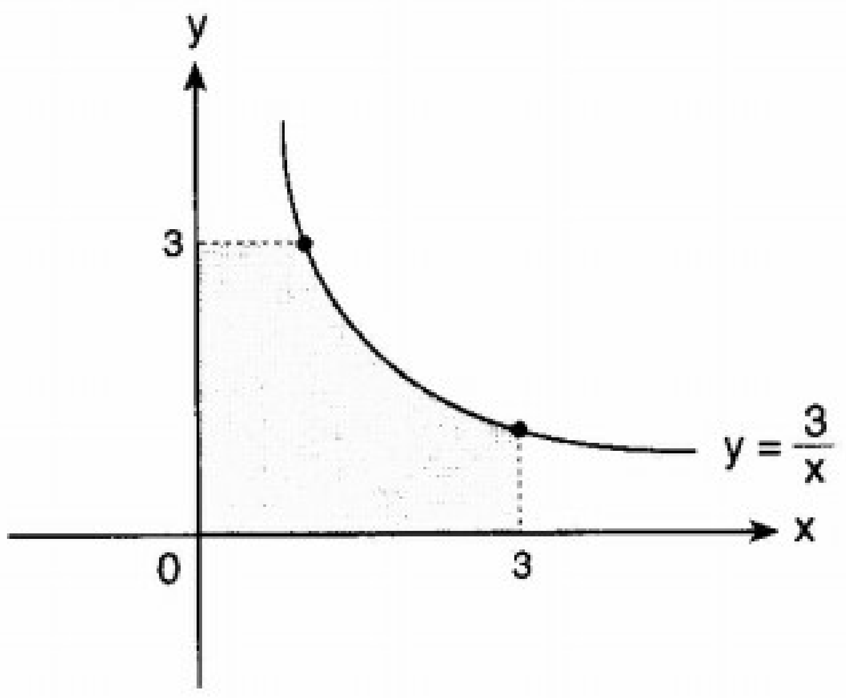
2.


y
y = f(x)
x
0
1
e
e^4

$f(x) = \ln x \Rightarrow$ **Taralı alan / *The shaded area* = ? br^2 / u^2**

A) $e^4 - 1$
B) $e^4 + 2$
C) $4e^4 - e$
D) $3 \cdot e^4$
E) $e^4 + 5$

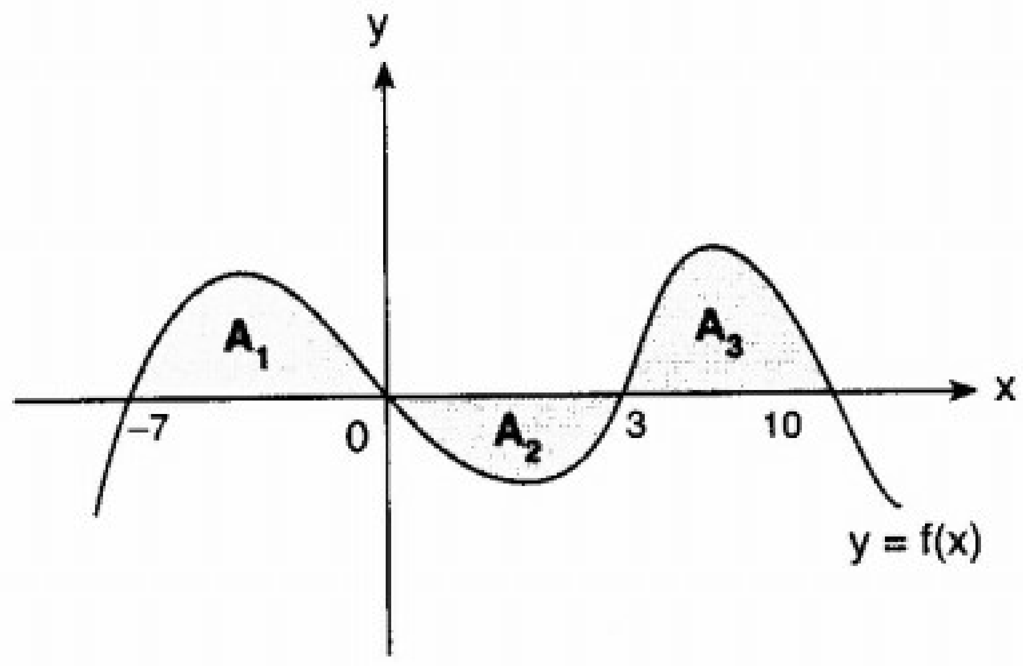
3.


y
3
$y = \frac{3}{x}$
0
3
x

Taralı alan / *The shaded area* = ? br^2 / u^2

A) ln18 + 1
B) ln18 + 3
C) ln27
D) ln27 + 1
E) ln27 + 3

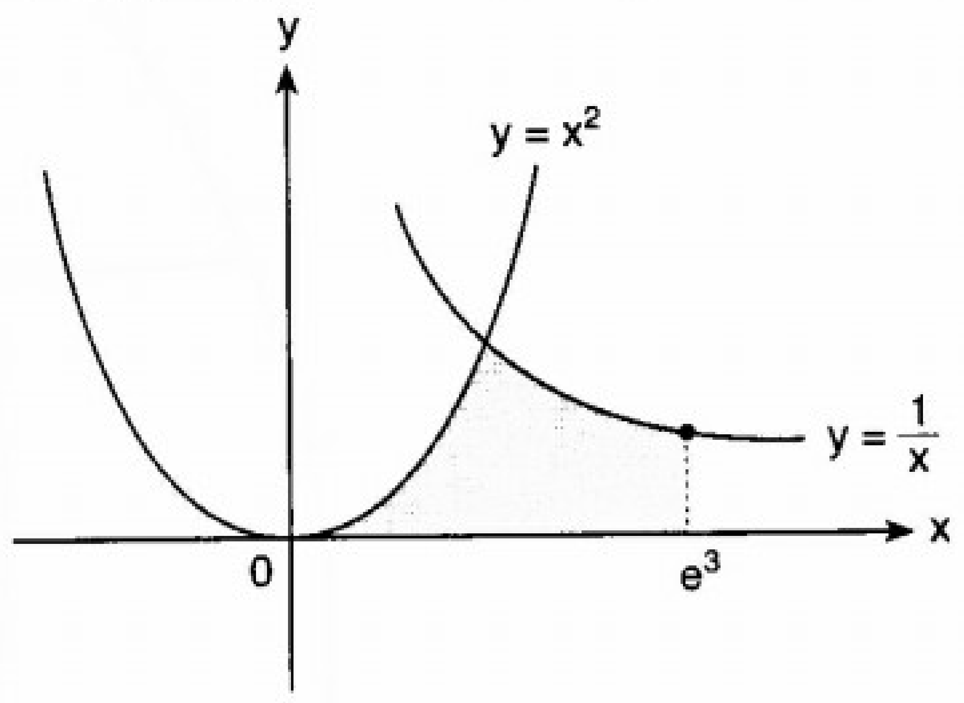
4.


y
A_1
A_3
x
A_2
–7
0
3
10
y = f(x)

$A_1 = 10br^2/u^2,\ A_2 = 2br^2/u^2,\ A_3 = 15br^2/u^2 \Rightarrow \int_{-7}^{10} f(x)\,dx = ?$

A) 27
B) 23
C) 15
D) 7
E) –3

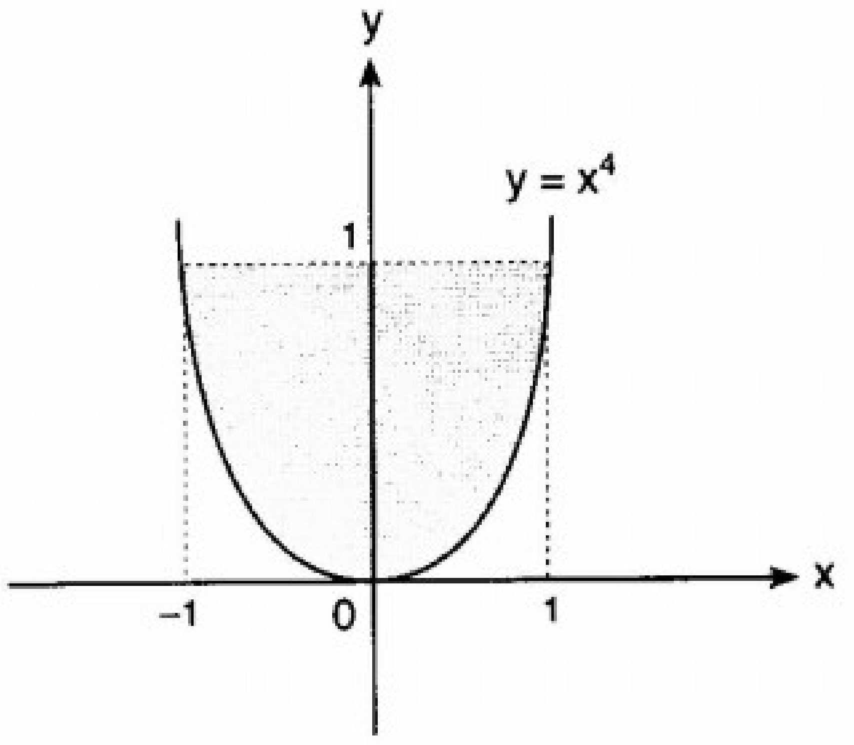
5.


y
$y = x^2$
$y = \frac{1}{x}$
x
0
e^3

Taralı alan / *The shaded area* = ? br^2 / u^2

A) $\frac{4}{3}$
B) $\frac{5}{3}$
C) $\frac{8}{3}$
D) $\frac{10}{3}$
E) $\frac{14}{3}$

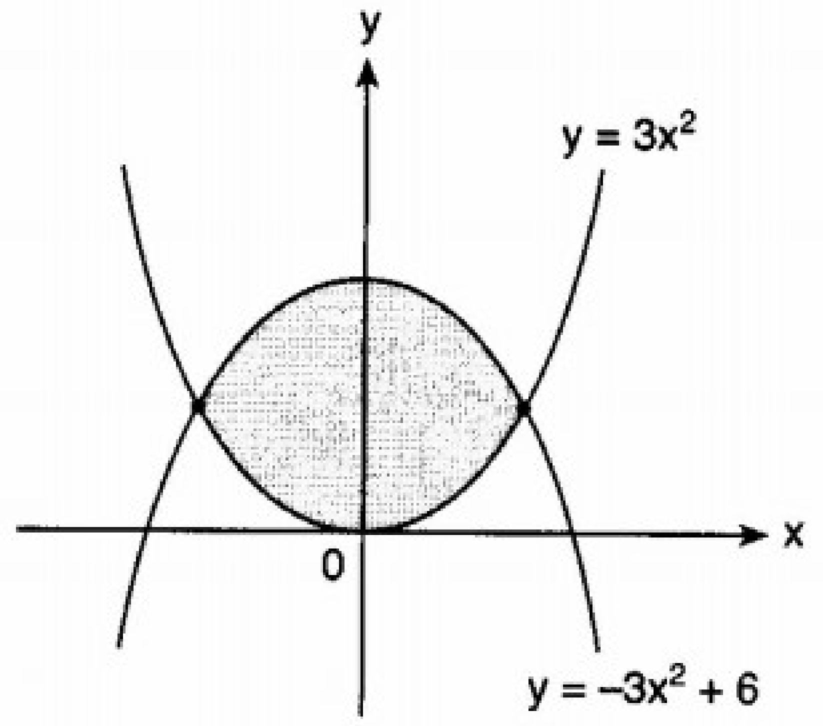
6.



Taralı alan / *The shaded area* = ? br^2 / u^2

A) $\frac{8}{5}$
B) $\frac{7}{5}$
C) $\frac{6}{5}$
D) 1
E) $\frac{4}{5}$

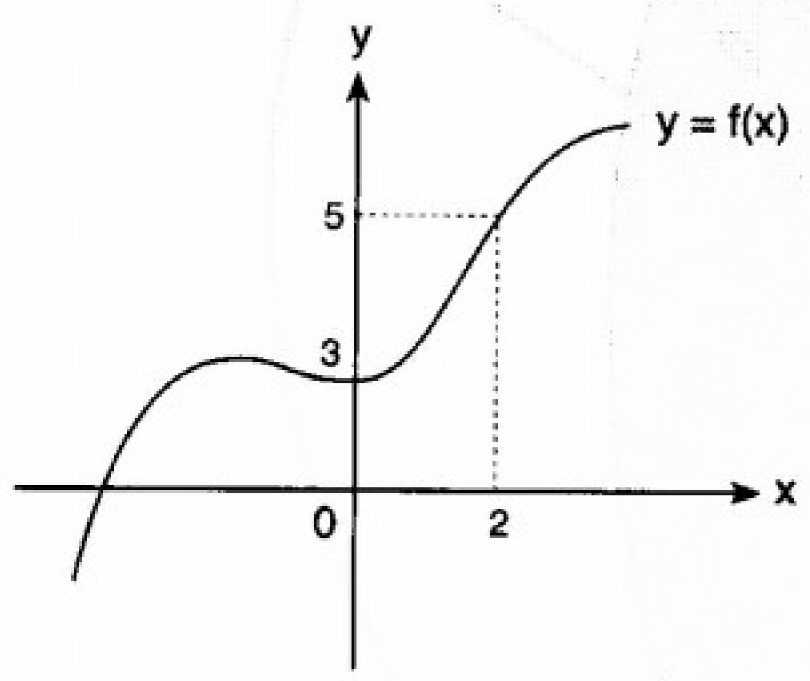
7.


y
y = 3x²
x
0
y = −3x² + 6

Taralı alan / *The shaded area* = ? br² / u²

A) 2
B) 4
C) 6
D) 8
E) 10

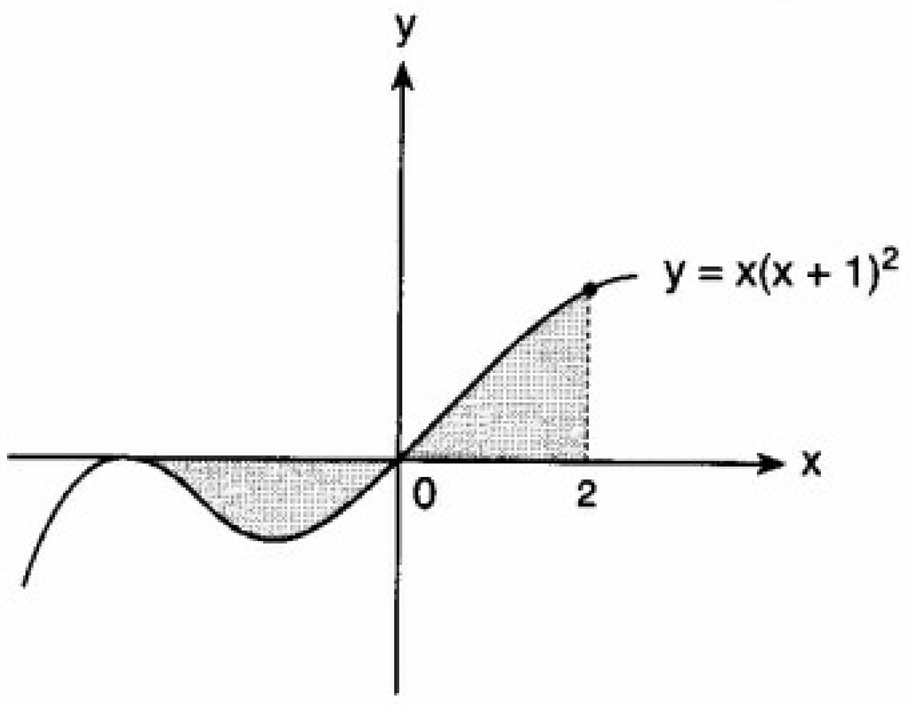
8.



$$\Rightarrow \int_0^2 f'(x)\,dx = ?$$

A) 2
B) 4
C) 6
D) 8
E) 10

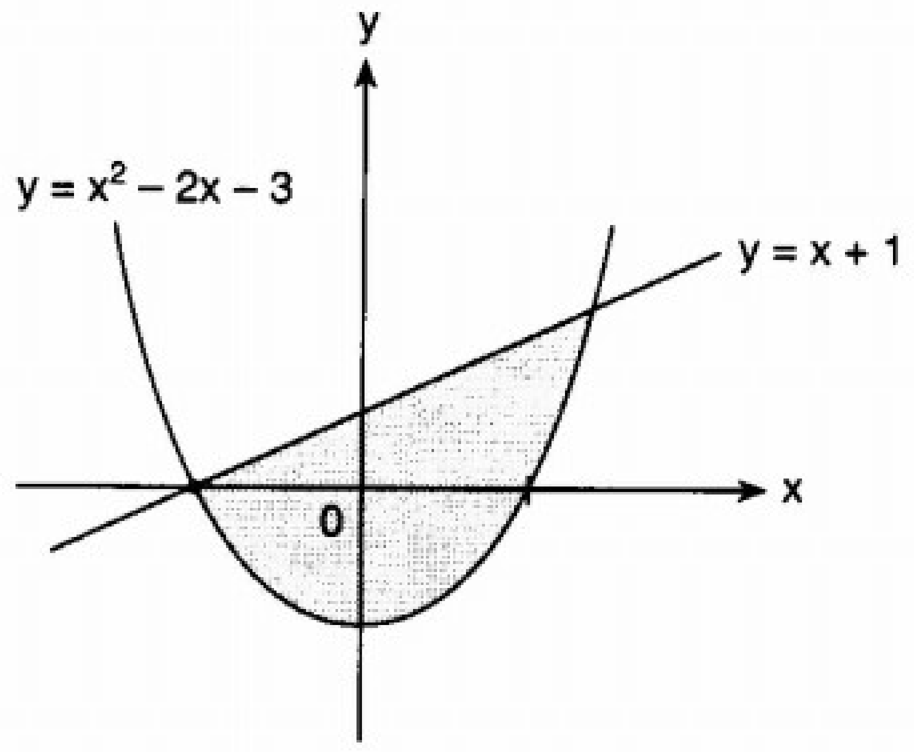
9.



Taralı alan / *The shaded area* = ? br² / u²

A) $\frac{127}{12}$
B) $\frac{135}{12}$
C) $\frac{137}{12}$
D) $\frac{141}{12}$
E) $\frac{143}{12}$

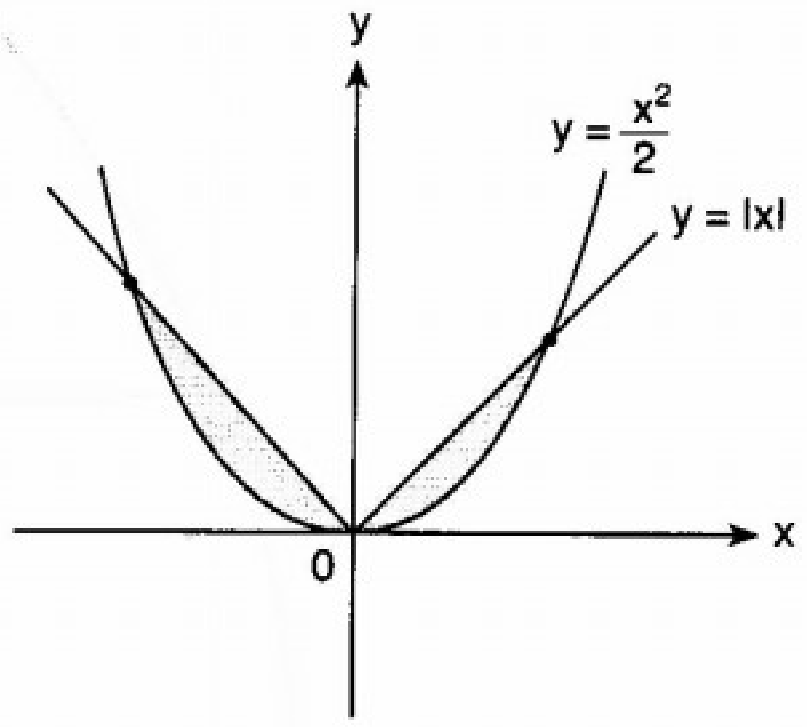
10.


y
y = x² − 2x − 3
y = x + 1
x
0

Taralı alan / *The shaded area* = ? br² / u²

A) $\frac{125}{6}$
B) $\frac{135}{6}$
C) $\frac{145}{6}$
D) $\frac{155}{6}$
E) $\frac{165}{6}$

11.

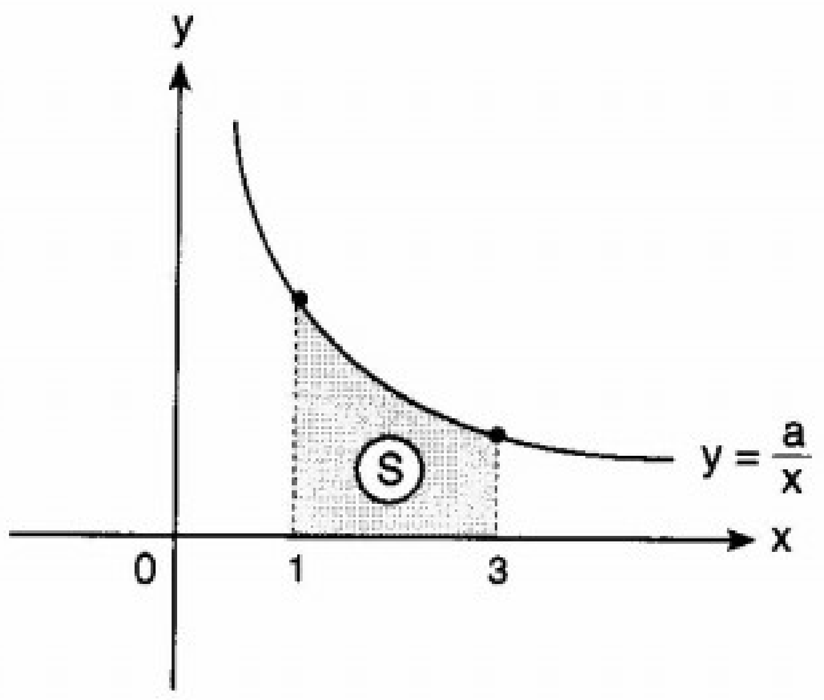


Taralı alan / *The shaded area* = ? br² / u²

A) $\frac{4}{3}$
B) 2
C) $\frac{7}{3}$
D) $\frac{8}{3}$
E) 3

12. S = ln 27 ⇒ **a = ?**

A) 1
B) 2
C) 3
D) 4
E) 5



YANITLAR / ANSWERS

1. D 2. D 3. E 4. B 5. D 6. A 7. D 8. A
9. C 10. A 11. A 12. C

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